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X II

THE
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Original Articles.

TORTULA INCLINATA, *Hook. & Grev.*, AS A BRITISH MOSS.

By Henry Boswell.

(Tab. 139.)

Since the publication of the list of Oxfordshire Mosses in the volume of the "Journal of Botany" for 1872, p. 367, in which allusion was made to the circumstance of *Tortula inclinata* having been found for the first time in Britain, twelve months have elapsed without bringing any notice, as hoped for, of its discovery in any other locality. Yet it seems very unlikely that a region apparently so unpromising for Mosses should have to boast of being the only one in the island in which a certain species is found; and it occurs to me that possibly a more extended notice, by calling attention to the subject in a way that the former brief note may have failed to do, will lead to more careful search and the discovery of this interesting stranger in some other place, as well as in more complete condition and greater quantity. To facilitate its recognition by those who may not have descriptions at hand, it will be well to give also Schimper's account of it in the "Synopsis Muscorum Europæorum," and reproduce his figures from the "Bryologia Europæa."

"*Barbula inclinata*, Schwg.—Dioicous; broadly-tufted, tufts plane, condensed. Stem short or taller, densely leafy. Leaves elongato-linear, undulated in the margins, the nerve whitish on the back, excurrent into a mucro; the perichætial longer, narrower, erect, with a looser areolation. Fruit-stalk flexuose, often spirally twisted; capsule yellowish or fuscous, cernuous, oval-oblong, more or less incurved and gibbous at the base. *Habitat:* gravelly and sandy ground near river-banks, or dry hills and subalpine calcareous situations. The short stems, rarely attaining an inch in length, the shorter, broader, and less curving leaves, and the shorter cernuous capsule readily distinguish it from *B. tortuosa*."—(Schimp. Synops., p. 178.)

Now, although the present species belongs strictly to the group or section *tortuosa*, it must not be inferred from the above remarks that it at all vies in appearance with *T. tortuosa*, as found in great tufts on limestone rocks and walls in the north and west of England. In fact the unfruiting plant far more nearly resembles *T. unguiculata* in size and general appearance, and it is as that species that it is liable to be overlooked, especially on a dry day when the foliage is dry and shrunken. It is not easy in a few words to point out the characters by which to distinguish them without magnifying power, but the application of a pocket lens to a tuft will show that the leaves are quite different in shape; *concave*, and *tapering to a point*, with an excurrent nerve, instead of being obtuse and apiculate as in *T. unguiculata;* and drying, too, with a quite different torsion. If these features cannot be satisfactorily made out, there remains only to bring the doubtful subject home to the microscope, under which it will be seen that there is difference enough. The fruit, should it occur, somewhat more resembles that of *T. convoluta*.

The Oxfordshire plants differ scarcely at all from others gathered in the South of France, being slightly more dwarfish only. A good many had female flowers, but no male plants nor capsules could be found. The locality is a curious one, not at first inspection seeming likely to detain a botanist long, consisting of a series of old stone quarries, partly now disused, forming banks and hollows overgrown in great measure with grass, amongst which are scattered here and there *Campanula glomerata*, *Gentiana Amarella*, *Thymus Serpyllum*, and so on; while in small spaces bare of grass are found several Mosses of interest besides the usual *Tortula unguiculata*, *T. fallax*, *Hyp. lutescens*, *H. molluscum*, and the like. Here grow *Leptotrichum flexicaule* and *Thuidium abietinum*, in the only spots at present known so near to Oxford; and here, in addition to the species immediately under notice, occur two near allies not previously ascertained to grow in the region at all, but scattered so sparingly amongst the herbage of the place that it was only in consequence of the very close search made for further supplies of the present plant that I found them: all three might indeed easily be passed over.

Altogether I have now four species to be added to the local list, and I cannot do better perhaps than conclude this notice with an enumeration of them.

Trichostomum luridum, *Hornsch.* (Didymodon.)--In dark, dwarfish, dense tufts, somewhat resembling *Tortula unguiculata;* upon stones at Headington, Sandford, Cumnor, and Witney. These plants were very puzzling: all had female flowers, but their leaves varied very considerably in degree of obtuseness and length of nerve. The basilar areolæ are different from those of *T. tophaceum*, to the description of which the leaves otherwise nearly approach.

T. crispulum, *Br.*—A few small tufts found on bare ground amongst grass at Holton.

Tortula squarrosa, *De Not.*—Also found at Holton, in hunting for further supplies of *T. inclinata*. Nothing but the closest possible examination of the ground would have detected it; the stems being nearly single, scattered throughout some yards of grassy ground.

T. papillosa, *Wils.*—On Elms at Kennington, and on orchard trees at Witney; scarce, growing mingled with *T. lævipila*.

DESCRIPTION OF TAB. 139.

Tortula inclinata, Hook. & Grev. Figs. A to H, from Oxfordshire specimens collected by Mr. Boswell. A, Plants; B, lower leaves; C C, upper leaves; D, perichætial leaf; E, sections of leaves; F, G, H, leaves showing cell-structure. Figs. 1—9. After Bruch and Schimper "Bryologia Europæa," vol. 2, *Barbula*, t. xii.

ON NEW AND LITTLE-KNOWN CAPSULAR GAMOPHYLLOUS LILIACEÆ.

By J. G. BAKER, F.L.S.

THROUGH the kindness of M. Alphonse De Candolle I have been allowed this autumn the loan of the Liliaceous portion of his herbarium for leisurely examination and comparison. The capsular gamophyllous part includes several new species, and authentic examples of some others, which, for want of fuller information, were misunderstood or treated imperfectly in my paper on the group in vol. xi. of the "Journal of the Linnean Society," p. 349. I give, therefore, now descriptions of these novelties, along with those of a few derived from other sources, and a running commentary on the paper in question, embodying any new synonyms or added information which I have received from any source whatever. The numbers of the genera are given as they stand in the original paper, and I number the added species, as has been done in the later editions of the "London Catalogue," so that they may be readily fitted into their proper places in the series.

2. HEMEROCALLIS.

5. H. DISTICHA, *Don.*, is a variety with leaves arranged distichously.

2*. HESPEROCALLIS.

1. H. UNDULATA, *A. Gray.*—The rootstock turns out to be truly bulbous, so that the affinity is with 26, *Odontostemum*, and Dr. Gray has suggested that *Hesperocallideæ* would be a more euphonious name for tribe 6 than *Odontostemoneæ*. X

3. KNIPHOFIA.

4*. K. MACOWANI, *Baker*, n.sp.—Folia rigidissima omnium, 12-18 lin. longa, supra basin 1½-2 lin. lata, venis utrinque costam 2-3 valde exsculptis, marginibus distincte denticulatis. Scapus foliis subæquilongus. Racemus densissimus 3-4 pollicaris, expansus 18-21 lin. latus, floribus infimis valde deflexis. Pedicelli brevissimi vix ultra ½ lin. longi. Bracteæ albæ lanceolatæ acutæ 2-3 lin. longæ. Perianthium flavum vel rubellum, 12-15 lin. longum, supra ovarium haud constrictum, exsiccatum ore 1½ lin. crassum. Genitalia inclusa. C.B.S. in graminosis clivis Montis Boschberg, alt. 4500 pedes. MacOwan, 1536! A most distinct species, easily recognisable by the texture, strong veins, and distinct denticulations of its rigid leaves. Mr. MacOwan has gathered it in quantity, and I hope will soon introduce it into cultivation.

6*. K. CAULESCENS, *Baker*, Hook. fil. Bot. Mag., t. 5946.—This

has been so fully dealt with lately by Dr. Hooker that it is quite needless to do more than mention it here. It was discovered by Mr. Thomas Cooper, in the Stormbergen Mountains, in the province of Albany, and sent home by him to Mr. Wilson-Saunders, who presented a plant to Kew, which may now be seen in the New Temperate House. It is the most distinct of all the species of this intricate genus, having a decided stem to the rosette of leaves, like a caulescent Aloe. The leaves are the broadest of all the known species, and very glaucous, and the stamens and style are exserted from the perianth from a quarter to half an inch.

7*. K. SCHIMPERI, *Baker*, n.sp.—Folia 1-1½-pedalia arundinacea, lævia, supra basin 4-6 lin. lata, venis tenuibus immersis obscuris utrinque costam 6-8, marginibus lævibus. Scapus 1-1½-pedalis. Racemus laxissimus omnium ½-1. pedalis, expansus 21-24 lin. latus, 15-30-florus. Pedicelli 1-1½ lin. longi. Bracteæ lanceolatæ acuminatæ 3-4 lin. longæ. Perianthium valde curvatum, sæpissime flavum, interdum rubellum, 12-15 lin. longum, supra ovarium distincte constrictum, ore exsiccatum 2-2½ lin. latum. Genitalia diutine inclusa. Abyssinia, prov. Tigré vel Begember. Schimper, 1200 of his recently distributed gatherings of 1863-8! Marked at a glance from all the other species by its long lax raceme.

8*. K. FOLIOSA, *Hochst.* in Schimp. Pl. Abyss. Exsic., no. 1003. —Folia ignota. Racemus densissimus ad pedem longus, expansus 1½-2 poll. longus, floribus infimis valde deflexis. Pedicelli 1½-2 lin. longi. Bracteæ duræ oblongo-lanceolatæ subobtusæ 3 lin. longæ. Perianthium flavum vel rubellum, 9-11 lin. longum, supra ovarium constrictum, exsiccatum ore 2½ 3 lin. latum, dentibus deltoideis 1 lin. longis. Genitalia omnia exserta. Stylus ex perianthio demum 5-6 lin. exsertus. Abyssinia. Schimper in Herb. Candollei! May perhaps prove to be identical with *K. Quartiniana*, A Rich.

10*. K. COMOSA, *Hochst.*, in Schimp. Pl. Abyss. Exsic., no. 401.— Folia pedalia vel sesquipedalia, supra basin 4-6 lin. lata, arundinacea lævia, venis utrinque costam 10-12, marginibus integris. Scapus 1½-2-pedalis. Racemus densissimus, 3-6 poll. longus, floriferus expansus 18-21 lin. latus, floribus inferioribus valde deflexis. Pedicelli ½-1 lin. longi. Bracteæ lanceolatæ acutæ 2-3 lin. longæ. Perianthium flavum vel rubrum anguste infundibuliforme 6-7 lin. longum, supra ovarium distincte constrictum, ore exsiccatum 2-2½ lin. latum. Genitalia omnia exserta, staminibus longioribus vel stylo demum perianthio vix brevioribus. Abyssinia. Schimper, 401 in Herb. Candollei, and nos. 1145 and 1192 of 1863-8, sent from the provinces of Tigré and Begember. Very near *pumila* of the Cape, from which it differs mainly by its narrower leaves and smaller bracts.

12*. K. PORPHYRANTHA, *Baker*, n.sp.—Folia 1-1½-pedalia, arundinacea, supra basin 4-5 lin. lata, lævia, venis perspicuis utrinque costam 6-8, marginibus integris. Scapus 1½-2-pedalis. Racemus densissimus bipollicaris, expansus 21-24 lin. latus, floribus deflexis. Pedicelli brevissimi. Bracteæ albæ lanceolatæ acuminatæ 3-4 lin. longæ. Perianthium purpureum, nullo modo rubellum, tubulosum, 12-15 lin. longum, supra ovarium haud constrictum, ore exsiccatum 1½ lin. latum. Genitalia diutine inclusa. C.B.S. in ditione "Orange

Free State." Cooper, 3207! 3208! Perhaps nearest *sarmentosa*, from which it differs by its very short podicels, longer purple flowers, and included stamens.

8. ANDROSTEPHIUM.

1*. A. BREVIFLORUM, *Ser. Wats.*, Amer. Nat., May, 1873, p. 7.— 303 Scapus semipedalis. Umbellæ 4-7 floræ, pedicellis 6-15 lin. longis. Perianthium violaceum, 6-7 lin. longum, segmentis lanceolatis tubo campanulato subæquilongis. Corona 3-linearis. Capsula globoso-triquetra. Utah meridionalis et Arizona borealis. Mrs. E. P. Thompson. More robust than *violaceum*, with smaller flowers. Bulb esculent.

12. MILLA.

2. M. BIFLORA, *Cav.*—This appears, judging from the description, to be the plant described by S Schauer, Linnæa 19, p. 702, Walp. Ann. i., 865, as a new genus, under the name of *Diphalangium*.

21*. M. VIOLACEA, *Baker.*—*Triteleia violacea*, Kunth Enum., iv., 468.—Folia 5-6 anguste linearia glabra carnoso-herbacea 1-1½-pedalia 1½-2 lin. lata. Scapus debilis foliis subæquilongus. Valvæ spathæ 2 lanceolatæ 12-15 lin. longæ deorsum connatæ. Umbellæ 4-6-floræ, pedicellis 9-12 lin. longis. Perianthium violaceum infundibuliforme, segmentis oblongo-lanceolatis 3 lin. latis tubo campanulato 3-4-plo longioribus. Stamina in tubo biseriata, filamentis linearibus 3 lin. longis. Stylus filiformis 4 lin. longus ovario superans. Chili. Bertero, 290! in Herb Candollei. *Gardinia violacea*, Bertero MSS., Vulgo "Mapolita." On view of type specimens I find this is distinct from *bivalvis*, to which I joined it, though very nearly allied. It has a larger flower, with a longer style and narrower filaments.

13. MASSONIA.

7*. M. (EUMASSONIA) SCHLECHTENDALII, *Baker*, n.sp.—*M. scabra* Schlect. in Herb. Cand. non Andrews.—Bulbus ovoideus 8-9 lin. crassus. Folia 2 carnoso-herbacea obovato-spathulata acuta glabra 2-3 poll. longa 1-1½ poll. lata, facie pus-tulis duris scabra, marginibus nullo modo ciliatis. Corymbus sessilis 10-12-florus, bracteis exterioribus oblongo-spathulatis acutis 6-9 lin. longis. Pedicelli 2-3 lin. longi. Perianthium album 8 lin. longum, segmentis patentibus anguste ligulatis tubo æquilongis. Filamenta alba, segmentis æquilonga, ad basin filiformia. Caput Bonæ Spei, Schlechtendal in Herb. DC.!

25*. M. (POLYXENA) ODORATA, *Hook. fil*, Bot. Mag., t. 5891.—A well-marked new species, sent by Dr. Arnott to Kew Gardens from the province of Colesberg.

16. DIPCADI.

1. D. SEROTINUM, *var.* FULVUM.—Add as synonym *Hyacinthus sulphureus*, Poir., Kunth. Enum iv., 305.

8. D. MONTANUM, *Baker.*—The plant figured by Wight, Icones, t. 2064, as *Urginea coromandelina* turns out to be this, not the true *Scilla coromandelina* of Roxburgh, which is really an *Urginea*.

17. LACHENALIA.

3. L. TRICOLOR, *Thunb.*—*L. lutea*, Lindl. Gard. Chron. 1856, 404, 1872, t. 109—*L. aurea*, Florist, t. 265—is a fourth variety of this species with deep orange-yellow flowers.

14. L. PUSTULATA, *Jacq.*—*L. pyramidalis*, Dehn. Walp. Ann. i., 853—appears, judging from the description, to be a synonym.

16*. L. CAMPANULATA, *Baker*, n.sp.—Folium solitarium teres carnoso-herbaceum glabrum, basin scapi arcte cingens, 1½ pollicare, basi 1½ lin crassum, ad apicem sensim attenuatum. Scapus bipollicaris. Racemus densus pollicaris 10-12-florus expansus 6-7 lin. latus. Pedicelli erecto-patentes, infimi 1 lin. longi, bracteis minutis deltoideis. Perianthium coccineum campanulatum 1½-2 lin. longum, segmentis subæquilongis, stylo longe exserto. C.B S., in lapidosis summi Montis Boschberg. MacOwan, 1836! Allied only to *convallarioides* and *Zeyheri*, from which the characters given will readily separate it.

19. MUSCARI.

12. Add to synonyms of *M. racemosum*, *M. acutilobum*, Bert. Nov. Comm. Bon. v., 431, Walp. Ann. i., 856.

17d. M. PARADOXUM, *K. Koch.*, Linnæa 22, 253—*Hyacinthus paradoxus*, Fisch. & Mey. Ind. Sem. i., 30, non Baker.—Bulbus parvus ovoideus truncatus. Folia 2 lorata carnoso-herbacea glabra 5-6 poll. longa 1½-2 lin. lata ad basin attenuata venis immersis. Scapus gracilis foliis paulo brevior. Racemus densus pollicaris expansus 8-9 lin. latus. Pedicelli patentes infimi 1 lin. longi. Bracteæ minutæ deltoideæ. Perianthium saturate cæruleum subglobosum 2 lin. longum, ore lato, dentibus minutis deltoideis. Stamina in tubo biseriata, antheris minutis. Guriel. Szovits, in Herb. DC., from Fischer and Meyer. Upon view of a type specimen I see that I have quite misunderstood this from the brief description, and that it has nothing to do with *Bellevallia flexuosa*.

17*. M. LINGULATUM, *Baker*, n.sp.—Bulbus ovoideus 6-9 lin. crassus. Folia 2-3 synanthia anguste lingulata carnoso-herbacea glabra 2½-3 poll. longa, supra medium 3-4 lin. lata, marginibus nullo modo ciliatis. Scapus 2½-3-pollicaris, superne livide cæruleus. Racemus densus subspicatus 20-30-florus 8-10 lin. longus, expansus 5-6 lin. latus. Pedicelli brevissimi vel subnulli, bracteis obsoletis. Perianthium cæruleum subglobosum 1¼ lin. longum, ore aperto, dentibus minutis deltoideis. Stamina prope faucem tubi biseriata. Asia Minor. Aucher Eloy, 5398! Midway between *botryoides* and *Aucheri*.

21. DRIMIA.

In Bot. Bemerk., p. 114, Presl has placed all the species given by Kunth under *Idothea* under a new genus, which he constitutes under the name of *Idothearia*.

11*. D. HYACINTHOIDES, *Baker*, n.sp.—Folia hysteranthia ignota. Scapus 1½-2-pedalis strictus fragilis rubellus glaber. Racemus floriferus 3-4 poll. longus, 1½-2 poll. latus, superne densus, inferne laxus, pedicellis ascendentibus 6-15 lin. longus. Bracteæ ligulatæ membranaceæ rubellæ 2-3 lin. longæ, basis dorso longe calcaratæ. Perianthium campanulatum rubrum 3-4 lin. longum segmentis ovato-oblongis imbricatis planis 1¼-1½ lin. latis tubo campanulato æquilongis. Genitalia inclusa nullo modo declinata. Stamina ex apice tubi uniseriata, filamentis lanceolatis albis antheris luteis oblongis 1 lin. longis brevioribus. Stylus filiformis ovario æquilongus. C B.S. in convallibus umbrosis prope Grahamstown. MacOwan 1465! A very distinct species, receding from *Drimia* towards *Hyacinthus* by its broad flat perianth-segments and short straight stamens.

22. HYACINTHUS.

11. H. DALMATICUS, *Baker*, proves to have been earlier published, curiously under the same specific name, by Fischer and Meyer, Ind. Sem. Petrop. 1846, p. 71.

6. H. AMETHYSTINUS, *L.*—Under this are included the following species of Jordan and Fourreau's Icones, viz., *pyrenæus*, tab. 237; *montanus*, tab. 238; *pallidiflorus*, tab. 239, and *curvulus*, tab. 240.

13*. H. (BELLEVALLIA) EXSCULPTUS, *Baker*, n.sp.—Bulbus globosus 6-8 lin. crassus. Folia 2 opposita basin scapi longe cingentia patula lanceolata undulata firma 1½-2 poll. longa medio 4-6 lin. lata venis valde exsculptis primariis 6-8 marginibus distincte ciliatis. Scapus bipollicaris foliis prope medium patulis. Racemus dense capitatus deltoideus 6-10-florus 6-8 lin. longus. Pedicelli subnulli, bracteis obsoletis. Perianthium tubulosum 4 lin. longum 1½ lin. crassum siccitate fuscum dentibus deltoideis tubo quadruplo brevioribus. Stamina ex fauce tubi uniseriata, antheris cæruleis filamentis linearibus æquilongis. Asia Minor inter Aleppo et Mossul. Olivier! in Herb. Candollei. Closely allied to *H. sessiliflorus.*

13*. H. (BELLEVALLIA) HAYNEI, *Baker.*—Bulbus ovoideus 6-8 lin. crassus. Folia 2 basin scapi arcte cingentia opposita linearia falcata 3-4 poll. longa 2-3 lin. lata acuminata rigide subcoriacea venis dorso valde exsculptis, facie glabra, margine minute ciliata, dorso dimidio inferiore pilis hispidis fuscis dense setulosa. Scapus gracilis glaber 2-3-pollicaris. Racemus subspicatus 1-1½ pollicaris expansus 4-5 lin. latus. Pedicelli brevissimi erecto-patentes vel subnulli. Bracteæ minutæ deltoideæ. Perianthium 2 lin. longum saturate cæruleum, segmentis ovato-deltoideis tubo oblongo ¾ lin. crasso 3-4-plo brevioribus. Stamina ex fauce tubi uniseriata filamentis brevissimis complanatis antheris oblongis cæruleis. Moab, in Wady Zerka Main. Hayne. A pretty little plant, intermediate between *sessiliflorus* and *hispidus*, with the dense subspicate flowers of the former and bristly leaves of the latter. One of the few novelties gathered on the Moab expedition, of the botany of which the late Mr. Hayne, so untimely lost to science, gave an account in our pages.

16*. H. (BELLEVALLIA) PERSICUS, *Boiss. & Buhse*, Auf. Transc. p. 213.—Bulbus ovoideus magnus tunicis fusco-cinerascentibus. Folia bina flaccida linearia canaliculata flexuosa 2-3 poll. longa 1½ lin. lata. Scapus gracilis flexuosus foliis æquilongus. Racemus corymbosus 6-8-florus, pedicellis strictis demum periantho æquilongis. Bracteæ minutæ deltoideæ. Perianthium campanulatum cæruleo-violaceum 3 lin. longum lobis brevibus oblongis. Filamenta medio tubi inserta, deorsum dilatata, antheris ovatis violaceis. Persia borealis prope Mendschil. Buhse.

20*. H. (Bellevallia) syriacus, *Baker*—*Bellevallia syriaca*, Herbert Bot. Reg. 1844 Misc., p. 89.—Folia plura glauca lanceolata subpedalia 5-6 lin. lata subacuta glabra margine scaberula. Scapus 5-10-pollicaris superne purpurascens. Pedicelli floriferi erecto-patentes, infimi 3-lin. longi. Bracteæ minutæ deltoideæ bilobæ. Perianthium 6 lin. longum, tubo pallide cæruleo segmentis subalbescentibus apice subrufescentibus æquilongo. Filamenta alba basi complanata, antheris fusco-purpureis. Ex Oriente (loco speciali ignoto). Fox-Strangways in Hort. Herbert. Perhaps not distinct from *romanus*.

22*. H. (Bellevallia) Olivieri, *Baker*, n sp.—Bulbus ovoideus 1½-2 poll. crassus. Folia 3-4 basin scapi longe cingentia superne falcata, oblongo-lanceolata carnoso-herbacea semipedalia acuta, medio 15-21 lin. lata, marginibus callosis ciliis distinctis patulis vel deflexis præditis. Scapus semipedalis, ad basin racemi 3 lin. crassus. Racemus 20-30-florus, floriferus 2-3 poll. longus 1½ poll. latus, sursum densus, deorsum laxus, pedicellis inferioribus cernuis 3-4 lin. longis, centralibus ascendentibus. Bracteæ minutæ deltoideæ. Perianthium tubulosum 5-5½ lin. longum, 1½ lin. crassum, siccitate fuscum, dentibus oblongo-deltoideis tubo triplo brevioribus. Stamina ex fauce uniseriata, filamentis linearibus 1 lin. longis. In valle fluminis Tigris inter Mossul et Bagdat. Olivier in Herb. DC.

23*. H. (Bellevallia) capitatus, *Baker*, n.sp.—Bulbus ovoideus 9-10 lin. crassus. Folia bina, basin scapi amplectentia lorata falcata carnoso-herbacea 3-3½ poll. longa 6-8 lin. lata, venis immersis, apice deltoideis leviter cucullatis, marginibus minute ciliatis. Scapus 3 pollicaris rectus modice crassus. Racemus subspicatus dense capitatus 15-20-florus 9-10 lin. longus, 7-8 lin. latus. Bracteæ obsoletæ. Perianthium tubulosum 3-3½ lin. longum, 1½ lin. crassum, siccitate fuscum segmentis ovato-deltoideis tubo triplo brevioribus. Stamina ad faucem uniseriata, filamentis lanceolatis, antheris minutis oblongis cæruleo-purpureis. Ex Oriente (loco speciali ignoto). Olivier! in Herb. DC.

24*. H. paradoxus, *Baker, non Fisch. & Meyer*.—Must now be called *H. flexuosus*, Baker.

26. H. ciliatus.—Add synonym *H. patulus*, Bert. Nov. Comm. Acad. Bon. v., 430, Walp. Ann. i., 854.

28. H. glaucus, *Baker*.—Add synonym *H. purpureus*, Griffith Icones, t. 275, Notulæ, p. 242.

ELEMENTARY PROOF OF THE RULE FOR DETECTING SPIRAL ARRANGEMENT.

By F. E. Kitchener, F.L.S..

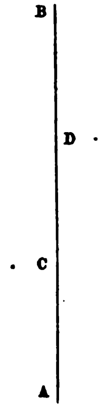
When the subject of spiral arrangements is taken in our text-books, the rules by which an intricate spiral arrangement can be detected by means of the approximating secondary spirals are given without any demonstration.

Perhaps some particular spiral is drawn, and the rules are shown to be true in this instance, and the learner is forced to make his induction from a simple instance.

The following proof seems to me capable of comprehension by an intelligent learner, and it has the advantage of showing how far the rules depend on the spirals found in nature belonging to the particular series of fraction $\frac{1}{2}$, $\frac{1}{3}$, $\frac{2}{5}$, as distinguished from any other.

The rules generally given are:—Detect two leaves, (C) and (D), nearly above the leaf from which you start (A); count the number of leaves from A to C, and those from A to D; these two added together will give you the denominator of the fraction expressing the fundamental spiral you are seeking, while the less of these two numbers gives you its numerator.

The student is then shown satisfactorily how to count the leaves from A to C by the number of parallel secondary spirals, but the original rule is generally left as an article of faith.



I propose to prove that in any spiral, whether in the natural series $\frac{1}{2}$, $\frac{1}{3}$, $\frac{2}{5}$, &c., or in any other:

1. The sum of the number of coils between A and C, and between A and D, gives the numerator of the fundamental fraction.

2. The sum of the number of leaves between A and C, and between A and D, gives its denominator.

Let B be the unknown leaf exactly above A. D is by supposition the leaf which is most approximately above A to the right without being actually above it; similarly B is the leaf which is most approximately above C without being exactly above it*; moreover it diverges to the right of C, just as D diverges to the right of A. Hence B has the same position with respect to C that D has with respect to A, and, since by supposition the spiral is uniform, the number of *leaves* and of *coils* between C and B is the same as the number between A and D.

Hence in either case, leaves or coils, to count from A to C, and then from A to D, is the same as to count from A to C and then from C to B, that is, to count the whole way from A to B.

Hence the sum of the numbers of coils from A to C and from A to D is the number of coils from A to B, or the numerator of the fundamental fraction sought.

And the sum of the numbers of leaves from A to C and from A to D (not inclusive) is the number of leaves from A to B (not inclusive), and therefore gives the denominator of the fundamental fraction.

It should, then, be noticed that in the series $\frac{1}{2}$, $\frac{1}{3}$, $\frac{2}{5}$, $\frac{3}{8}$, each numerator (after the first two) is the same as the denominator of the last fraction but one, or of the less approximating of the two converging secondary spirals, and hence the trouble of counting the coils may be avoided.

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* Note.—If this be doubted, suppose that some other leaf between A and B is more nearly above C to the right than B, then this new leaf would be more nearly above A to the left than C is, and therefore C would not be the leaf most nearly above A diverging to the left which we supposed it to be.

This simplification is, however, not true of other series occasionally found, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{7}$, $\frac{3}{11}$, $\frac{5}{18}$, for instance, and therefore the blind following of this part of the ordinary rule is to be deprecated, inasmuch as it fails to be true if the branch examined should vary from the ordinary spiral.

ON THE FLORA OF THE ENVIRONS OF BRADFORD.

BY JOHN WILLIS, PH.D.

(*Portion of a Paper read at the Meeting of the British Association, September* 18*th*, 1873)

IN ascending from the level of the Exchange to the summit of Rombalds Moor, we rise nearly a thousand feet. At the lowest point a dwarf Bamboo or a hardy Palm may survive the winter in our gardens; but the Laurustinus is not found in our shrubberies, and even the common Cherry-Laurel scarcely can be said to thrive. Deciduous trees, however, clothe the sides of the valleys wherever they have been left undisturbed by the hand of man. On the elevated table-land, on the contrary, the eye would search in vain for any solitary plant rising above the Heather or the Crowberry.

Besides the change in the character of the vegetation which we perceive in changing our level, and which appears to depend on change of temperature, we have to consider that which we observe on passing from the vicinity of the town either to the mountain-limestone regions on the west, or to the magnesian limestone on the east. That much of this last-named diversity is due to geological causes cannot be doubted; but we must at the same time bear in mind that when we proceed eastwards we soon descend upon a warmer, more cultivated plain, and that a journey to the west of no great length places us under the genial influence of air warmed by the Gulf Stream.

To bring more clearly into view the characteristic features of the limestone flora, two lists are given as appendices to this paper, one containing the names of all the plants (as described in Babington's "Manual") which have been found on the clays and grits of the immediate neighbourhood of Bradford, the other those plants which have only been met with in one or the other of the limestone regions. It is not pretended that these lists are complete. Some genera, as *Rubus* and *Hieracium*, require further study, and many plants must have been overlooked, especially in the more remote districts. At the same time it is doubtful whether the most careful search would fill up all the lacunæ which a glance at these pages discovers, many of which must strike with astonishment anyone who has been accustomed to the sunny South. I do not remember to have found in this part of the country, except in a state of cultivation, any of the following genera and species :—*Myosurus*, *Malva rotundifolia*, *Geranium pusillum*, *Erodium*, *Onobrychis*, *Pyrus Aria*, *Scleranthus*, *Cotyledon*, *Ægopodium*,

Viburnum Lantana, *Asperula cynanchica*, *Centaurea Cyanus*, *Cichorium*, *Picris*, *Helminthia*, *Campanula Trachelium*, *Cuscuta*, *Echium*, *Solanum nigrum*, *Orobanche*, *Salvia*, *Calamintha officinalis*, *C. Acinos*, *Galeopsis Ladanum*, *Lysimachia Nummularia*, *Euphorbia amygdaloides*, *Ceratophyllum*, *Carpinus*, *Spiranthes*, *Iris fœtidissima*, *Acorus*.

On making a summary of the species which do appear in the appended lists, I find that they amount to 607 out of the 1707 of Babington's "Manual," and that 144 of these are plants which have only been found in the limestone regions. Confining our attention to the less rare plants—for no argument can be founded on the absence of a rarity—we observe with especial interest a number of species which are commonly found in Craven, on the one hand, or near Pontefract or Askern on the other, or in both of these districts, but which are rarely or never seen in the neighbourhood of Bradford. Of these we may mention in particular, as characteristic of the Craven district, *Arabis hirsuta*, *Sisymbrium thalianum*, *Draba muralis*, *D. verna*, *Viola lutea*, *Alsine verna*, *Spiræa Filipendula*, *Pinguicula vulgaris*, *Primula farinosa*, *Juniperus communis*, *Sesleria cærulea*, *Kœleria cristata*, *Cystopteris fragilis*, *Asplenium viride*. As distinctive of the Askern flora we may note *Reseda lutea*, *R. Luteola*, *Viola odorata*, *Hippuris vulgaris*, *Bryonia dioica*, *Œnanthe fistulosa*, *Conium maculatum*, *Hottonia palustris*, *Samolus*, *Humulus*, *Orchis Morio*, *Colchicum autumnale*, *Hordeum murinum*. Finally, as alike distinguishing both these regions from the Bradford district, we have *Helianthemum vulgare*, *Malva sylvestris*, *Poterium Sanguisorba*, *Galium verum*, *Scabiosa Columbaria*, *Primula veris*, *Ophrys muscifera*. Most of these, except the water plants, probably require a limestone soil to enable them to maintain their ground; and the same may be said of several species which are only occasionally met with in one or both of the limestone areas, as *Clematis Vitalba*, *Anemone Pulsatilla*, *Actæa spicata*, *Hypericum hirsutum*, *Rhamnus catharticus*, *Melilotus officinalis*, *Galium Mollugo*, *Carlina vulgaris*, *Carduus nutans*, *Campanula glomerata*, *Chlora perfoliata*, *Orchis ustulata*, *O. pyramidalis*, *Ophrys apifera*, *Convallaria majalis*, *Polypodium calcareum*, *Ceterach officinarum*. But to account for the absence from the neighbourhood of Bradford of such plants as *Hottonia*, *Hydrocharis*, *Utricularia*, and the Water Lilies, we have only to observe that, instead of the deep pools or well-filled ditches in which these plants live, we have here only streams which partake more or less of the character of mountain torrents.

To determine with regard to every particular plant which is found on the limestone, but not on the millstone grit or the coal measures, the reason for its preference of one region to the other, would require a more extensive investigation than can be undertaken here; but there can be little doubt that one result of such an inquiry would be to show that in many if not in most cases the preference is not for limestone as a *chemical* substance, but as a substance possessing those *physical* properties (the effects probably of chemical action) which constitute the difference between a warm, dry soil and a damp, cold one.

Moors.—The highest parts of the moors are mainly occupied by plants of a low degree of organisation, the only exceptions being the *Ericaceæ*. The stones and the soil alike are covered with Lichens and Mosses. Among the former are many species of *Lecidea* (including *L. geographica* in occasional patches) and varieties of *Cladonia*, *Scyphophorus*, and *Parmelia*. Numerous species of *Jungermannia* also form moss-like tufts. Various *Cyperaceæ* and *Juncaceæ* compete with the *Cryptogamia* and *Ericaceæ*, and sometimes one plant, sometimes another, gets such advantage in the struggle as to obtain exclusive possession of considerable tracts. Few *Gramineæ*, if any, are encountered on these high grounds, their place being taken by the so-called Bent (*Juncus squarrosus*) and by Cotton-Grass (*Eriophorum vaginatum*). On descending a little, however, we come upon mat-like tufts of *Nardus stricta*, and this plant, with *Festuca ovina*, the diminutive *Aira præcox*, and an *Agrostis* or two, ultimately takes possession of large portions of the surface, to the exclusion of all competitors. In the depressions, where the common *Sphagnum* and *Polytrichum* take the place of the other Mosses, and the *Calluna* and *Erica cinerea* yield to *Erica Tetralix*, *Juncus squarrosus* is replaced by *J. conglomeratus*, *J. effusus*, and other species, *Eriophorum vaginatum* by *E. angustifolium*, and the Mat-Grass by *Molinia cærulea*. Instead of *Vaccinium Myrtillus* and *V. Vitis-idæa*, in like manner, we find, trailing on the *Sphagnum* in company with *Drosera rotundifolia*, the graceful *Vaccinium Oxycoccos*. Here, too, may sometimes be seen *Eleocharis acicularis* and *Carex pulicaris*, and, contending with the Heather on all sides, an abundance of *Empetrum nigrum*. Where the water collects in still greater quantity, so as to form little ponds, the surface of the latter is often covered with *Potamogeton natans*, and the margin is fringed here with *Myosotis palustris*, there with *Equisetum limosum*, or with the spikes of *Narthecium*, or with a mossy bed on which trails the delicate *Anagallis tenella* or the *Hydrocotyle*. If we follow one of the numerous rivulets or gills which descend on all sides from this high region, we shall at first be struck with the continued predominance of Cryptogams. The stones in the bed of the stream are green and purple with luxuriant tresses of *Jungermannia*. In addition to the Mosses found near the stagnant pools, we have now dense masses of *Bartramia*; and the fronds of *Lastrea Oreopteris*, *Blechnum boreale*, and *Athyrium Filix-fœmina* attract our admiration. But suddenly, as if to startle us by the contrast, there appears, nestling in a rocky cleft at our feet, and standing as it were a sentinel above the forest trees in the wood below, the hardy but elegant Rowan-tree (*Pyrus Aucuparia*), not an unworthy herald of the gnarled Oak, the feathery Ash, the flowing Beech, or the drooping Wych-Elm (*Ulmus montana*). We have now only a narrow belt of Gorse and Brake (*Ulex europæus* and *Pteris aquilina*) between us and the upland pastures.

PASTURES.—Continuing our descent, we come, before entering the wood, upon groups of farm-buildings, surrounded, not by planations of *Coniferæ*, but by rather fine trees of Sycamore (*Acer Pseudo-platanus*). The lanes which connect these farms are gay with flowers throughout the summer months. Here grow *Trifolium minus*, *Potentilla Tormentilla*, *Galium saxatile*, *Arenaria serpyllifolia*, and *Polygala vulgaris*. Here, too, and in the surrounding fields we welcome the appearance of *Rhinanthus Crista-galli*, *Euphrasia officinalis*, *Veronica officinalis*, *Prunella*, *Campanula rotundifolia*, *Linum catharticum*, and *Hieracium Pilosella*. To the *Gramineæ* previously found we have now to add *Anthoxanthum*, *Aira flexuosa*, *Aira cæspitosa*, and *Holcus lanatus*; to the *Juncaceæ*, *Luzula campestris* and *L. multiflora*; to the *Cyperaceæ* numerous *Carices*, including *præcox*, *glauca*, *flava*, *stellulata*, and *ovalis*; and to the Cryptogams, *Lastrea Filix-mas*, *L. dilatata*, and *Equisetum sylvaticum*. We may hope even to fall in with *Gentiana Amarella*, *Habenaria viridis*, *Ophioglossum*, and *Botrychium*. The wayside streamlet, moreover, furnishes *Ranunculus hederaceus*, *R. Flammula*, *Cardamine pratensis*, *Stellaria uliginosa*, *Montia*, *Chrysosplenium oppositifolium*, *Veronica Beccabunga*, and occasionally *V. scutellata*.

WOODS.—In February, before the snow is well off the ground, some woodland dell is made bright by the bells of the Snowdrop (*Galanthus*). During the following month the Sallow (*Salix caprea*) and the Hazel, with the less conspicuous *Mercurialis perennis*, reign supreme, until they are eclipsed by *Anemone nemorosa*. The *Jungermanniæ* and other *Hepaticæ* are now thrusting up their sporangia on the side of every dripping bank or rocky wall. From these our attention may be attracted by *Narcissus Pseudo-Narcissus*. But it is in the month of May, when the Apple-tree is in blossom, that these wooded glens afford the greatest attractions to the admirer of floral beauty. As we stroll along the bottom of the glen, we are drawn by the white blossoms of *Stellaria Holostea* or *Asperula odorata*, mingled with the blue of *Myosotis sylvatica* and the red of *Lychnis diurna*, by beds of *Stellaria nemorum* and *Allium ursinum*, alternating with the purple spikes of *Orchis mascula*, with the gorgeous yellow of *Caltha*, or with the pale primrose of *Primula vulgaris*, or by an unbroken sheet of deep blue formed by myriads of closely-packed racemes of *Endymion nutans*, which appears to be nowhere more at home than in a Yorkshire wood. On proceeding up the glen, trampling under foot such plants as *Geum rivale*, *Oxalis*, *Lysimachia nemorum*, and *Adoxa*, or the less attractive *Stachys sylvatica* or *Galeobdolon*, *Lathyrus macrorhizus*, *Sanicula*, and *Bunium*, and thrusting aside the canes of the Raspberry (*Rubus Idæus*), or the boughs of Maple (*Acer campestre*), Birch (*Betula alba*), or Alder—the Yorkshire "Eller"—we may stumble upon that cadaverous-looking parasite, *Lathræa squamaria*, or fall in with *Rhamnus Frangula* or *Euonymus europæus*, and can hardly fail to find, near the dark foliage, it may be, of the Holly (*Ilex*), the bright racemes of the Bird-Cherry (*Prunus Padus*), even if we overlook the singular *Paris*, or such unobtrusive plants as Rushes, Grasses, and Ferns, among which *Luzula pilosa*, *L. sylvatica*, *Melica uniflora*, *Milium*, and above all *Dryopteris*, *Phegopteris*, and *Polystichum aculeatum*, deserve something more than a passing glance. If we choose the month of August for our visit, the plants which chiefly strike the eye will be *Hypericum pulchrum*, *Angelica sylvestris*, *Epilobium hirsutum*, *Spiræa Ulmaria*, *Lonicera Periclymenum*, *Digitalis*, *Melampyrum pratense*, and *Phalaris arundinacea*, with occasional patches of *Corydalis claviculata*, *Œnanthe crocata*, *Festuca gigantea*, and *Bromus asper*. In the late autumn, finally, we shall have our attention riveted by the red berries of *Viburnum Opulus* and *Tamus communis*, and shall find a multitude of *Fungi*.

MEADOWS AND HEDGEROWS.—In such situations may be found (besides many of those before named, and many more which occur in all parts of the country under like conditions) *Stellaria graminea*, *Sarothamnus*, *Genista tinctoria*, *Sanguisorba*, *Alchemilla vulgaris*, *Galium cruciatum*, *Scabiosa succisa*, and *Polygonum Bistorta*. The following plants are remarkably frequent:—*Lathyrus pratensis*, *Veronica Chamædrys*, *Ajuga reptans*, *Pedicularis sylvatica*, *Tussilago*, *Centaurea nigra*, *Knautia arvensis*, *Rumex acetosa*, and *R. Acetosella*.

STREAMS AND POOLS.—In the water of its ditches, rivers, and ponds, or on their banks, the district we are considering possesses but few plants which can be regarded as characteristic. Of the genus *Salix* it has, besides commoner species, *S. pentandra* and *S. Helix*. *Alnus* and *Populus nigra* abound, as do the following herbaceous plants:—*Geranium pratense*, *Barbarea vulgaris*, *Linaria vulgaris*, *Vicia Cracca*, *Campanula latifolia*, *Petasites*, *Tragopogon*, *Myrrhis*, *Glyceria aquatica*. In some places that recent intruder *Anacharis Alsinastrum* has obtained a firm footing, and one reservoir abounds in *Littorella lacustris*. On the other hand, *Lysimachia vulgaris* is absent, and *Lythrum Salicaria* a rarity. *Populus alba* is also rarely seen, and we look in vain for *Populus tremula*.

CORNFIELDS.—Our corn-lands also present little that is characteristic—less, probably, from any peculiarity in the climate than from their comparative infrequency. Some cultivators grow plentiful crops of *Spergula arvensis*, and the lands of others are white with *Matricaria inodora* and *Raphanus*, yellow with *Sinapis arvensis*, red with *Papaver Rhæas*, or blue with *Viola tricolor*. The genera *Euphorbia*, *Chenopodium*, and *Atriplex* are represented, if not by numerous species, at least by many individuals. We only occasionally meet with *Chrysanthemum segetum*, *Lithospermum arvense*, and *Veronica Buxbaumii*, and very rarely with *Borago* and *Camelina*.

No account is here taken of the difference between the flora of the coal measures and that of the millstone grit. My observations have been too limited to enable me to make such a comparison with any confidence in the correctness of the result. This branch of the subject is, however, to be commended to future inquirers, along with an inquiry into the deficiencies of the limestone flora.

APPENDICES.

Note.—In both appendices the rarer plants are enclosed thus (—); if a plant has not been found growing by the writer it is enclosed thus [—].

I. PLANTS FOUND IN BRADFORD DISTRICT.

Note.—The letter W denotes that the plant to the name of which it is appended occurs in the Valley of the Wharfe, bordering on the limestone, or in a similar position in Airedale. Plants concerning which it is doubtful whether they should be included in the list are printed in italics.

Thalictrum minus W; Anemone nemorosa; Ranunculus aquatilis, hederaceus, Flammula, Ficaria, auricomus, acris, repens, bulbosus, sceleratus, arvensis; Caltha palustris; (Eranthis W); Aconitum W. Papaver Rhœas. Corydalis claviculata; Fumaria capreolata, officinalis. (Cheiranthus W); Nasturtium officinale; Barbarea vulgaris; Arabis hirsuta W; Cardamine sylvatica, hirsuta, pratensis, amara; Hesperis W; Sisymbrium officinale; Alliaria; Brassica Napus; Sinapis nigra, arvensis; Draba verna W; Cochlearia officinalis W; (Camelina); Lepidium campestre; Capsella; Raphanus Raphanistrum. Viola palustris, (odorata), canina, tricolor. Drosera rotundifolia; Parnassia W. Polygala. Silene inflata; Lychnis Flos-cuculi, vespertina, diurna, (Githago); Sagina procumbens; Mœhringia; Arenaria serpyllifolia; Stellaria nemorum, media, Holostea, graminea, uliginosa; Cerastium glomeratum, triviale. Malva moschata, *sylvestris* W. Tilia parvifolia. Hypericum quadrangulum, perforatum, dubium, humifusum, pulchrum. Acer 2 sp. Geranium (phæum), sylvaticum W, pratense, dissectum, molle, lucidum, Robertianum.* Linum catharticum. Oxalis Acetosella. Euonymus europæus. Rhamnus Frangula. Ulex europæus; Genista tinctoria, anglica; Sarothamnus; Ononis arvensis; Medicago lupulina; Trifolium pratense, medium, repens, procumbens, minus; Lotus corniculatus, major; Anthyllis; Vicia tetrasperma, Cracca, sepium, sativa; Lathyrus pratensis, macrorhizus. Prunus communis,† Padus, (Cerasus); Spiræa Ulmaria; Sanguisorba; Poterium Sanguisorba W; Agrimonia Eupatoria; Alchemilla vulgaris, arvensis; Potentilla anserina, reptans, Tormentilla, Fragariastrum; Fragaria vesca; Rubus Idæus, corylifolius, &c.; Geum 3 sp.; Rosa *tomentosa?*, canina, arvensis; Cratægus; Pyrus Malus, Aucuparia. Lythrum Salicaria. Epilobium angustifolium, hirsutum, parviflorum, montanum; Circæa lutetiana. Myriophyllum spicatum. Montia. Spergula arvensis. (Sedum acre); (Sempervivum). Ribes Grossularia W, rubrum W. Saxifraga tridactylites W, (granulata); Chrysosplenium alternifolium W, oppositifolium. Hydrocotyle; Sanicula; Helosciadium nodiflorum; Bunium flexuosum; Pimpinella Saxifraga; Œnanthe crocata; Æthusa; Silaus; Angelica; (Pastinaca W); Heracleum; Daucus Carota; Torilis Anthriscus; Scandix; Anthriscus sylvestris; Chærophyllum temulum W?; Myrrhis. Adoxa; Hedera. Sambucus nigra; Viburnum Opulus; Lonicera Periclymenum. Sherardia; Asperula odorata; Galium *boreale* W, cruciatum, Aparine, saxatile, uliginosum, *palustre?*. Valeriana officinalis, dioica; Valerianella olitoria. Knautia; Scabiosa succisa. Eupatorium; Petasites; Tussilago; Bellis; Solidago W; (Bidens tripartita); Anthemis Cotula; Achillea Ptarmica, Millefolium; Chrysanthemum 2 sp.; Matricaria *Parthenium*, inodora; Artemisia campestris W?; Tanacetum W?; Filago germanica W; Gnaphalium uliginosum; Antennaria dioica W; Senecio vulgaris, *viscosus?*, sylvaticus, Jacobæa, aquaticus; Arctium minus; Centaurea nigra, *Scabiosa?*; Carduus lanceolatus, arvensis, palustris; Lapsana;

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* A coarse form of *Erodium circutarium* appeared as a weed in garden ground manured with the refuse of Australian wool, with which it is probable it was introduced.

† *P. communis* does not fruit.

Hypochæris radicata; Apargia 2 sp.; Tragopogon minor; Lactuca muralis; Leontodon; Sonchus oleraceus, arvensis; Crepis virens, paludosa, W; Hieracium Pilosella, murorum, W?, vulgatum, umbellatum. (Jasione); Campanula latifolia, rotundifolia. Calluna; Erica Tetralix, cinerea; Vaccinium Myrtillus, Vitis-idæa, Oxycoccos; Pyrola media. Ilex. Ligustrum; Fraxinus. Erythræa Centaurium; Gentiana Amarella W; [Menyanthes]. Convolvulus arvensis, sepium W. (Borago); (Anchusa sempervirens); Lycopsis; [Pulmonaria officinalis]; (Lithospermum arvense); Myosotis palustris, sylvatica, arvensis, versicolor, *collina*? Solanum Dulcamara. Lathræa. Verbascum W; Digitalis; Linaria Cymbalaria, vulgaris; Scrophularia nodosa, aquatica; Melampyrum pratense, *sylvaticum*?; Pedicularis sylvatica; Rhinanthus Crista-galli; Euphrasia 2 sp.; Veronica scutellata, Beccabunga, Chamædrys, montana, officinalis, serpyllifolia, arvensis, agrestis, (Buxbaumii), hederifolia. Mentha aquatica, arvensis; (Lycopus); Origanum W; Thymus; Calamintha Clinipodium; Scutellaria galericulata W; Prunella; Nepeta Glechoma; Lamium purpureum, album. Galeobdolon; Galeopsis Tetrahit; Stachys Betonica, sylvatica, palustris, (arvensis); Ballota fœtida; Teucrium Scorodonia; Ajuga reptans. Pinguicula vulgaris. Primula vulgaris, (veris); Lysimachia nemorum; Anagallis 2 sp. Plantago lanceolata, media, major; Littorella. Chenopodium album, Bonus-Henricus; Atriplex angustifolia, erecta, hastata. Rumex conglomeratus, *sanguineus*?, crispus, Acetosa, Acetosella; Polygonum Bistorta, amphibium, *lapathifolium*, *laxum*?, Persicaria, aviculare, Convolvulus. Empetrum. Euphorbia Helios, copia, Peplus, exigua; Mercurialis perennis. Callitriche verna, platycarpa. *Parietaria erecta*?; Urtica urens, dioica. Ulmus (suberosa), montana. Salix pentandra, fragilis, alba, triandra, Helix, viminalis, cinerea, (aurita?), Caprea; Populus (alba), nigra; Betula alba, *glutinosa*?; Alnus; Fagus; Castanea; Quercus; Corylus. (Pinus). Paris. Tamus. Anacharis. Orchis mascula, maculata; Gymnadenia conopsea W; Habenaria viridis, bifolia; Listera ovata; (Neottia); Epipactis palustris W. Iris Pseud-acorus; (Crocus vernus). (Narcissus biflorus), Pseudo-narcissus; Galanthus. Allium ursinum; Endymion. Narthecium; Juncus effusus, conglomeratus, *glaucus*?, acutiflorus, lamprocarpus, supinus, squarrosus, compressus, bufonius; Luzula sylvatica, pilosa, campestris, multiflora. Alisma Plantago; (Sagittaria); (Butomus); Triglochin palustre. (Typha latifolia); Sparganium ramosum, simplex. Arum. Lemna minor. Potamogeton natans, perfoliatus, crispus, pectinatus. Eleocharis palustris, acicularis; Scirpus (sylvaticus), (setaceus); Eriophorum vaginatum, angustifolium; Carex pulicaris, vulpina, *divulsa*?, paniculata, *axillaris*?, remota, stellulata, ovalis, *stricta*?, acuta, vulgaris, pallescens, panicea, *pendula*?, præcox, glauca, flava, fulva, sylvatica, hirta, *paludosa*, *riparia*. *Phalaris canariensis*, arundinacea; Anthoxanthum; Phleum pratense; Alopecurus pratensis, geniculatus, agrestis; Milium; Agrostis *canina*?, vulgaris, *alba*?; Aira cæspitosa, flexuosa, (caryophyllea?), præcox; Trisetum; Avena pratensis; Arrhenatherum; Holcus 2 sp.; Triodia; Melica uniflora; Molinia; *Catabrosa*?; Poa annua, nemoralis, trivialis, pratensis; Glyceria aquatica, fluitans; Briza media; Cynosurus cristatus; Dactylis; Festuca ovina, *rubra*?, gigantea, *arundinacea?*, pratensis; Bromus asper, sterilis; Serrafalcus *commutatus?*, mollis, *racemosus?;* Brachypodium sylvaticum W; Triticum *caninum?*, repens; Lolium perenne, *italicum?;* Nardus. Equisetum arvense, Telmateia, sylvaticum, limosum, *palustre?*, *variegatum?*. Polypodium vulgare, Phegopteris, Dryopteris; Lastrea Oreopteris, Filix-mas, dilatata; Polystichum aculeatum; Athyrium Filix-fœmina; Asplenium (Adiantum-nigrum), Trichomanes W, Rutamuraria; Scolopendrium; Blechnum; Pteris; Botrychium; Ophioglossum. Lycopodium clavatum W. Chara vulgaris.

II. PLANTS ABSENT FROM THE BRADFORD FLORA WHICH ARE FOUND IN THE LIMESTONE REGIONS EAST OR WEST OF BRADFORD.

Note.—The letters E and W are appended where the plant has only been observed on the East or West respectively. Where no letter is appended the plant has been found in both regions.

(Clematis Vitalba); (Thalictrum minus W), (T. flavum E); (Anemone Pulsatilla E); (Trollius europæus W); (Aquilegia vulgaris E); (Actæa spicata). (Berberis vulgaris E). Nymphæa alba E; Nuphar lutea E. Papaver Argemone E; (Chelidonium majus E). Sisymbrium thalianum W; (Diplotaxis muralis E); (Armoracia rusticana E); Draba muralis W; [Hutchinsia petræa W]; Senebiera Coronopus E. Reseda lutea E, Luteola E. Helianthemum vulgare. Viola lutea W, hirta W. Saponaria officinalis E; Alsine verna W; Cerastium semidecandrum E, arvense E. Malva sylvestris. Hypericum hirsutum, montanum E. Geranium sanguineum W, columbinum W. Rhamnus catharticus. Melilotus officinalis; (Astragalus hypoglottis E). Spiræa Filipendula W; Rubus cæsius E, saxatilis W; [Dryas octopetala W]; Rosa spinosissima W. Myriophyllum verticillatum E; Hippuris E. Bryonia dioica E. Sedum Rhodiola W, (album W), anglicum W, (reflexum W). (Saxifraga umbrosa W), hypnoides W. Helosciadium inundatum W; Pimpinella magna; Œnanthe fistulosa E, Phellandrium E; (Anthriscus Cerefolium E), vulgaris E; Conium E; (Smyrnium E). Cornus sanguinea E. Galium boreale W, Mollugo, verum. Dipsacus sylvestris E; Scabiosa Columbaria. Erigeron acris E; Inula Conyza E; Pulicaria dysenterica E; Carlina; Serratula W; Carduus nutans W, heterophyllus W. Campanula glomerata E. Chlora E; Gentiana campestris W. Polemonium W. (Cynoglossum officinale W); Symphytum officinale E; (Lithospermum officinale W). Atropa Belladonna; Hyoscyamus niger. Linaria minor E; Pedicularis palustris E; [Bartsia alpina W]; Veronica Anagallis W. Nepeta Cataria E; (Lamium amplexicaule E), incisum E; Galeopsis versicolor E. (Verbena officinalis W). Utricularia vulgaris E. Primula farinosa W; Hottonia palustris E; Lysimachia vulgaris E; Samolus E. Plantago maritima W. Chenopodium rubrum E. Rumex Hydrolapathum E; Polygonum Hydropiper E. Daphne Laureola E. Parietaria diffusa E; Humulus E. Salix aurita E; Populus tremula W. Taxus baccata W. Juniperus communis W. Hydrocharis E; [Stratiotes E]. Orchis Morio E, ustulata E, pyramidalis E; Ophrys apifera E; muscifera; Epipactis latifolia E, media? W. Convallaria majalis; [Polygonatum multiflorum

W]. (Ornithogalum umbellatum E); [Gagea lutea W]. Colchicum E. Juncus glaucus E. Alisma ranunculoides E. Lemna trisulca E. Potamogeton densus E; Zannichellia palustris E. Scirpus lacustris E; Carex stricta E, paludosa, riparia. (Arundo Calamagrostis W); Phragmites E; Sesleria W; Kœleria W; Melica nutans W; (Sclerochloa rigida); Bromus erectus E; Hordeum murinum E. Polypodium calcareum W; Lastrea Thelypteris E, [rigida W]; Polystichum Lonchitis W; Cystopteris fragilis W; Asplenium viride W; Ceterach officinarum W. Lycopodium selaginoides W, Selago W.

THE MOSS-FLORA OF WARWICKSHIRE.

By James E. Bagnall.

With the exception of a few plants noticed in Purton's "Midland Flora," and Perry's "Plantæ Varvicenses Selectæ," I do not know of any record of the Mosses indigenous to the county of Warwick, and having a desire to know what Mosses really did occur in this county, I commenced (in 1867) working the northern division, giving, however, more especial attention to those parts nearest to Birmingham. After having worked the marls, clays, sandstones, &c., of North Warwickshire for some time, I thought it would be well to take the county as a whole, with the hope of being able to publish a complete Moss-Flora of Warwickshire. This intention I have not been able to carry out satisfactorily, as want of leisure has unfortunately prevented my paying more than a few flying visits to the southern part of our county, so that the following list cannot be considered as in any way exhaustive. I am fully convinced that if I could find leisure to work well the lias soils of the southern part of our county, I should be able to add to my list materially. With about two exceptions, the Mosses enumerated below have been found by myself in the localities indicated, have been carefully examined microscopically, and in doubtful cases been sent to Dr. R. Braithwaite for confirmation or identification; and I may state that I am deeply indebted to this gentleman for assistance, advice, and kindly encouragement. Many of the Mosses mentioned below I have also found in several localities in the adjacent counties of Stafford and Worcestershire, having occasionally worked in both; but I have thought it better to keep the Warwickshire Flora distinct, and have therefore added as Addenda those Mosses found within a ten-mile radius of Birmingham, but not occurring, so far as I know at present, in Warwickshire. I have notified in each case if found fruiting, by the abreviation "fr" after the name.

Sphagnum acutifolium, Ehr., fr., *S. fimbriatum*, Wils., *S. cuspidatum*, Dill., *S. recurvum*, P. Beauv., *S. squarrosum*, Pers., *S. rubellum*, Wils. All in Sutton Park. *S. subsecundum*, Nees. Sutton Park, Coleshill Pool, Hill Bickenhill. Var. *contortum*, Sch. Sutton Park, Hill Bickenhill. Var. *obesum*. Hill Bickenhill. *S. laricinum ?*, Spr. Sutton Park (I find a Moss here which seems identical with specimens from Mr. Hunt). *S. cymbifolium*, Dill. Sutton Park, Wroxall Poors Wood, near Solihull. Var. *compactum*, var. *squarrosulum*, *S. papillosum*, Lind. All in Sutton Park.

Archidium phascoides, Brid, fr. Coleshill Pool, on the shores.

Pleuridium nitidum, Hedw., fr. Shirley, Earlswood. *P. subulatum*, Linn., fr. Frequent. *P. alternifolium*, B. & S., fr. Marstone Green (scanty).

Weissia tenuis, Schrad., fr., *W. microstoma*, Hedw., fr. Both at Edgbaston. *W. controversa*, Hedw., fr. Frequent. *W. cirrhata*, Hedw., fr. Solihull, Olton, Maxtoke, Sutton Park. *W. mucronata*, B. & S., fr. Olton, Maxtoke.

Dicranella crispa, Hedw., fr. Solihull. *D. cerviculata*, Hedw., fr. Sutton Park. *D. varia*, Hedw., fr. Erdington. *D. rufescens*, Turn., fr. Near Knowle. *D. heteromalla*, Hedw., fr. Sutton Park.

Dicranum montanum, Hedw. Sutton Park (abundant when I first found it, but almost lost through the felling of the tree on which it grew). *D. scoparium*, L., fr. Solihull. *D. majus*, Turn., fr. Solihull, Kiresley. *D. palustre*, Brid. Sutton Park. *D. spurium*, Hedw. Coleshill Heath (H. Webb).

Campylopus fragilis, Dicks. *C. torfaceus*, Br. & Sch. Both in Sutton Park.

Leucobryum glaucum, Hampe. Sutton Park.

Fissidens bryoides, Hedw., fr. Sutton Park. *F. exilis*, Hedw., fr. Haywoods, Bearley. *F. viridulus*, L., fr. Near Knowle. *F. incurvus*, Schwg., fr. Bearley, Solihull. *F. adiantoides*, Hedw., fr. Sutton Park. *F. taxifolius*, Hedw., fr. Olton.

Phascum muticum, Schreb., fr. Coleshill Heath, near Knowle. *P. cuspidatum*, Schreb., fr. Sutton Park. Var. *curvisetum*, fr. Coleshill Heath.

Pottia minutula, B. & S., fr. Solihull, Shirley, Red Hill. *P. truncata*, B. & S., fr. Sutton Park. *P. intermedia*, Turn., fr. Olton, Solihull, Exhall. *P. lanceolata*, Röhl., fr. Solihull, Bearley.

Ceratodon purpureus, Brid, fr. Sutton Park.

Leptotrichum flexicaule, Schwg. Marl Cliff, near Bidford.

Trichostomum rubellum, B. & S., fr. Sutton Park, Olton, &c. *T. tophaceum*, Brid , fr. Erdington, Olton.

Tortula cavifolia, Ehrh. (Not found in North Warwickshire) Bearley, Harbury. Var. *incana*, fr. Harbury. *T. rigida*, Schultz, fr. Wilmcote, Harbury. *T. ambigua*, B. & S., fr. Bearley. *T. aloides*, B. & S., fr. Bearley, Red Hill, Maxtoke. *T. mucronulata*, Brid., fr. Bidford, Wootton Wawen (very rare in fruit). *T. unguiculata*, Hedw., fr. Sutton Park. *T. insulana*, De Not. Sutton Park, Claverdon. *T. fallax*, Hedw., fr. Shustoke, Bearley, Erdington. *T. spadicea*, Mitt. Bearley, Red Hill. *T. rigidula*, Hedw. Ufton, Harbury. *T. Hornschuchiana*, Schultz. Shirley. *T. revoluta*, Schwg., fr. Solihull, Bearley, Burton, Claverdon. *T. convoluta*, Hedw., fr. Sutton Park, Whittacer, Gravelly Hill. *T. tortuosa*, W. & M. On mortar of old bridge, Olton. *T. atrovirens*, Eng. Bot., fr. A few specimens only, Drayton Bushes. *T. marginata*, B. & S., fr., *T. muralis*, Timm., fr. Both in Sutton Park. Var. *incana*, fr. Bearley, Canal Bank, on bridges. Var. *æstiva*, fr. Sutton Park. Var. *rupestris*, fr. Shrewley Heath, on Canal bridge. *T. subulata*, Brid., fr. Sutton Park, &c. *T. papillosa*, Wils. Forge Mills, Curdworth, near Alcester, near Stratford. *T. lævipila*, Brid., fr. Ufton, Harbury, &c. *T. intermedia*, Brid., fr. Binton, Temple Grafton. *T. ruralis*, Hedw. Rare in North Warwickshire, Shustoke, Grafton.

Encalypta vulgaris, Hedw. Earlswood.

Cinclidotus fontinaloides, P. B Binton (Purton's Mid. Flora, 1818, p. 257). I have not seen this at Binton.

Grimmia apocarpa, Hedw., fr. Olton, Elmdon, Coleshill. *G. crinita*, Brid., fr. Near Hatton (sparingly). *G. pulvinata*, Gm., fr. Solihull.

Racomitrium heterostichum, Hedw., fr. *R. lanuginosum*, Hedw. Both at Pinley. *R. canescens*, Hedw. Berkswell.

Hedwigia ciliata, Hedw., fr. Arbury Hall (T. Kirk).

Ptychomitrium polyphyllum, B. & S., fr. Binley, near Coventry.

Zygodon viridissimus, B. & S. Oakley Wood, near Stratford-on-Avon.

Ulota crispa, Hedw., fr. Near Solihull, Chalcot Wood.

Orthotrichum saxatile, B. & S., fr. Binton, Wilmcote. *O. obtusifolium*, B. & S. Near Stratford-on-Avon, Harbury. *O. tenellum*, B. & S , fr. Near Stratford-on-Avon (sparingly). *O. affine*, Schrad , fr. Solihull, Holywell, Morton Morrel. *O. diaphanum*, Schrad., fr. Olton, Alcester, Bearley, Binton. *O. Lyellii*, H. & T. Harbury, Bishop Tachbrook, Solihull.

Tetraphis pellucida, Hedw., fr. (rare in fruit). Wroxall Poors Wood, Solihull, Shirley.

Ephemerum serratum, Sch., fr. Coleshill Heath, Acock's Green, Solihull.

Physcomitrium pyriforme, Brid., fr. Sutton Park.

Entosthodon fasciculare, Sch., fr. Coleshill Heath, Duke's End, Ufton.

Funaria hygrometrica, Hedw., fr. Sutton Park.

Bryum pyriforme, Hedw., fr. Olton Reservoir, near Leamington. *B. nutans*, Schreb., fr. Sutton Park. *B. annotinum*, Hedw. Sutton Park, Marstone Green. *B. carneum*, Linn., fr. Erdington. *B. albicans*, Wahl. Binley, near Coventry (T. Kirk). *B. pendulum*, Horns, fr. Kenilworth Castle. *B. inclinatum*, Brid., fr. Stechford. *B. intermedium*, Brid., fr. Erdington. *B. binum*, Schreb., fr. Sutton Park, Hill Bickenhill. *B. murale*, Wils., fr. Olton, Ufton, Shrewley Heath. *B. atropurpureum*, W. & M., fr. Whittacer, Sutton Park. *B. cæspiticium*, L., fr., *B. capillare*, L., fr. Both in Sutton Park. Var. *cuspidatum*, fr. Forge Mills. *B. pseudo-triquetrum*, Sch., fr. Sutton Park. *B. pallens*, Swartz., fr. Small Heath. *B. turbinatum ?*, Hedw., fr., *B. argenteum*, Linn., fr. Both in Sutton Park. *B. roseum*, Sch., Marstone Green.

Mnium affine, Bland., *M. hornum*, L., fr., *M. undulatum*, Hedw. All in Sutton Park. *M. stellare*, Hedw. Maxtoke. *M. punctatum*, Hedw., fr., *M. subglobosum*, B. & S., fr. Both in Sutton Park.

Amblyodon dealbatus, P. B., fr. Sutton Park.

Aulocomnion androgynum, Schwg., *A. palustre*, Schwg. Both in Sutton Park.

Bartramia fontana, Brid., fr. (rare in fruit). Sutton Park. *B. pomiformis*, Hedw., fr. Sutton Park, Middleton.

Atrichum undulatum, P. B., fr. Sutton Park. Var. *attenuatum*, fr. Solihull (sparingly).

Pogonatum nanum, Brid., fr. Shirley, Castle Bromwich. Var. *longisetum*, fr. Chalcot Wood. *P. aloides*, Brid., fr. Great Packington, Shirley, &c. Var. *minus*, fr. Shirley Street.

Polytrichum gracile, Menz., fr., *P. formosum*, Hedw., fr. Both in Sutton Park. *P. piliferum*, Schreb., fr. Sutton Park, Curdworth. *P. juniperum*, Hedw., fr. Sutton Park, Minworth. *P. commune*, L., fr. Sutton Park, Acock's Green.

Fontinalis antipyretica, Linn. Holywell, near Stratford-on-Avon.

Cryphæa heteromalla, Brid., fr. Wolston Heath, near Stratford-on-Avon.

Neckera complanata, B. & S. Maxtoke, Elmdon.

Homalia trichomanoides, Brid. Solihull, Marstone Green.

Leucodon sciuroides, Schwg. Wootton Wawen, Wolston Heath, Exhall.

Leskea polycarpa, Ehrb., fr. Holywell, Forge Mills.

Anomodon viticulosus, H. & T. Rowington, Henley-in-Arden.

Thuidium tamariscinum, Hedw. Sutton Park.

Climacium dendroides, W. & M. Sutton Park.

Isothecium myurum, Brid. Rowington.

Homalothecium sericeum, B. & S., fr. Acock's Green.

Brachythecium glareosum, Bruch. Lapworth Street. *B. lutescens*, Dill. Bearley, Ufton. *B. albicans*, Dill. Marstone Green, Olton, Witton. *B. velutinum*, Dill., fr.; *B. rutabulum*, L , fr. Both in Sutton Park. *B. rivulare*, Bruch. Near Claverdon. *B. populeum*, Swartz, fr. Solihull.

Scleropodium cæspitosum, Wils. Holywell, Forge Mills, Curdworth.

Eurhynchium myosuroides, Dill. Haywoods. *E. striatum*, Schreb. Solihull. *E. piliferum*, Schreb. Olton Canal bank. *E. speciosum*, Brid., fr. Sutton Park. *E. Swartzii*, Turn. Near Stratford-on-Avon. *E. prælongum*, Dill., fr. Sutton Park. *E. pumilum*, Wils., fr. Olton Canal bank, Middleton.

Rhynchostegium tenellum, Dicks, fr. Marstone Green. *R. Teesdalii*, Sm. Oversley (Purton's Mid. Flora, p. 558). *R. confertum*, Dicks, fr.; *R. murale*, Hedw., fr.; *R. ruscifolium*, Dill., fr. All in Sutton Park.

Thamnium alopecurum, L., fr. Rowington, Maxtoke, Wootton Wawen.

Plagiothecium latebricola, Wils.; *P. elegans*, Hook.; *P. denticulatum*, Dill.; *P. sylvaticum*, Dill., fr. (rare in fruit). All in Sutton Park.

Hypnum stellatum, Schreb. Sutton Park. *H. chrysophyllum*, Brid. Yarningall Common. *H. serpens*, L., fr.; *H. irriguum*, Wils.; *H. riparium*, L., fr. All in Sutton Park. Var. *longifolium*. Wylde Green. *H. aduncum*, Hedw., fr. Sutton Park, Hill Bickenhill. *H. polygamum*, B. & S., fr. Solihull. Var. *stagnatum*. Near Stratford-on-Avon. *H. Sendtneri*, Schimp.; *H. intermedium*, Lindb., fr.; *H. vernicosum*, Lindb., *H. fluitans*, Dill., fr.; *H. filicinum*, L., fr.; *H. commutatum*, Hedw.; *H. falcatum*, Brid., fr.; *H cupressiforme*, Dill., fr.; and var. *minus*, fr. All in Sutton Park. Var. *lacunosum*, fr. Milverton. *H. resupinatum*, Wils., fr. Sutton Park. *H. Linebergii*, Mitt. Near Shirley. *H. molluscum*, Hedw. Sutton Park, near Stratford-on-Avon. *H. palustre*, L., fr. Sutton Park, near Holywell. *H. cordifolium*, Hedw., fr. Sutton Park. *H. giganteum*, Sch. Sutton Park, Acock's Green. *H. cuspidatum*, L.; *H. Schreberi*, Ehr. Both in Sutton Park. *H. purum*, L., fr. Sutton Park, Solihull. *H. stramineum*, Dicks. Sutton Park. *H. splendens*, Dill. Solihull. *H. squarrosum*, L., fr. (rare in fruit). Sutton Park. *H. triquetrum*, L. Olton.

ADDENDA.

Phascum patens, Hedw., fr. King's Norton, Worces.

Pottia Wilsoni, B. & S., fr. Moseley, Worces. (E. W. Badger.)

Tortula cuneifolia, Dicks, fr. Grosty Hill, Worces.

Encalypta vulgaris, Hedw., fr. Near the Lickeys, Worces.

Racomitrium fasciculare, Brid. Frankley, Worces. *R. aciculare*, Brid. Frankley, Worces.

Hypnum polymorphum, Hedw. Sedgely Stone Quarry, Staff. *H. uncinatum*, Dill. Moseley, Worces. *H. cupressiforme*, var. *longesetum*, fr. Lickeys, Worces. *H. scorpioides*, Dill. Moseley, Worces.

Hookeria lucens, Dill., fr. Moseley, Worces. (Westcott.)

SHORT NOTES AND QUERIES.

ADDITIONS TO THE FLORA OF HERTFORDSHIRE.—The following plants, mostly forms separated since the date of the original publication of the "Flora Hertfordiensis," have not, as far as I am aware, been previously recorded for Herts, although it is not unlikely that some of them are generally distributed throughout the county:—*Ranunculus peltatus*, Fr., Hatfield. *R. trichophyllus*, Chaix., Hatfield, St. Albans. *Arenaria leptoclados*, Guss., Hertford, Ware, Hatfield, St. Albans. *Epilobium obscurum*, Schreb., Ayot. *Galium palustre*, L., var. *Witheringii*, Sm., Hatfield. *Valeriana officinalis*, L., proper (= var. *Mikanii*, Syme), Baldock. *Arctium majus*, Schkuhr., Hatfield. *Atriplex deltoidea*, Bab., Hatfield. These are new to their respective districts:—*Sisymbrium Thaliana*, Hook., Baldock. *Camelina sativa*, Crantz., Watford. *Viola arvensis*, Murray, Hatfield. *Hypericum dubium*, Leers, Hatfield. *Prunus Cerasus*, L., proper, St. Albans. *Polygonum nodosum*, Pers., Hatfield, St. Margarets. *Amaranthus retroflexus*, L., Watford. *Anacharis canadensis*, Planch., Hatfield. *Typha angustifolia*, L., Hatfield. *Setaria viridis*, Beauv., Watford.—R. A. PRYOR.

PLANTS OF KIRTLING, CAMBRIDGESHIRE.—Kirtling is situated about five miles S.E. of Newmarket, and close to the borders of Suffolk, in the only well-wooded district of Cambridgeshire. The soil is principally clay over chalk. I have only enumerated those plants to which detailed localities have been assigned by Prof. Babington in his Flora of the county. They were all observed within half a mile of Kirtling Tower:—*Ranunculus sceleratus* (in a damp cornfield; a stunted glaucous form, about three inches high); *Papaver Lecoquii* (with orange-coloured juice); *Chelidonium majus; Silene noctiflora; Hypericum dubium; H. hirsutum; Rhamnus catharticus; Trifolium fragiferum; Melilotus officinalis; Spiræa Ulmaria; Epilobium montanum; Œgopodium Podagraria; Pimpinella magna; P. Saxifraga; Silaus pratensis; Angelica sylvestris; Arctium eu-minus; Carduus crispus* (the var. with subsolitary heads and peduncles naked at the top also occurs; it is mentioned in Ray's Catalogue, but Babington says that he has not seen or heard of it in the county); *C. palustris; Picris hieracioides; Helminthia echioides; Campanula Trachelium; C. rotundifolia; Verbascum Blattaria* (roadside, probably an escape); *Linaria Cymbalaria; Scrophularia nodosa; Euphrasia Odontites; Veronica agrestis; V. Buxbaumii; Mentha arvensis; Calamintha Clinopodium; Stachys palustris; Lysimachia vulgaris* (in a damp cornfield; a stunted, very floriferous form); *Euphorbia amygdaloides; E. exigua; Juncus glaucus* (form with a very lax panicle); *J. lamprocarpus; Carex pendula; C. sylvatica; C. Pseudo-Cyperus; Poa compressa; Bromus commutatus; B. arvensis; Lolium temulentum; Polypodium vulgare.* Few of these plants are either particularly rare or interesting in themselves; it is only with reference to the local flora that they can claim any special notice on either score. *Hypericum dubium* (Journ. Bot. 1878, p. 274) and *Verbascum Blattaria* have not before been recorded for the county. *Silene noctiflora, Euphorbia amygdaloides, Care pendula* (only now known certainly to occur in one other spot in the county), and *C. Pseudo-Cyperus* were noticed by Relhan (Catlidge = Kirtling) at apparently the same stations; and this locality has perhaps not been visited by any botanist since his time. Some, as *Trifolium fragiferum, Lysimachia vulgaris, Juncus lamprocarpus, Bromus commutatus* and *arvensis*, and *Lolium temulentum* have not been observed within some considerable distance; but the majority are plants which have their head-quarters in the neighbouring woodlands.—R. A. Pryor

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Lobelia urens.—At a recent meeting of the Lit. and Phil. Soc. of Manchester, Mr. J. C. Melvill exhibited specimens of *Lobelia urens* collected last summer near Axminster, its only British locality. The common where it was said to grow in 1836 is now cultivated, and no trace of the plant is to be seen; a mile or two farther on, however, beyond Shute Hill, it is in tolerable plenty, but exceedingly local. The flowers were in perfection on August 1st.

Lindsæa heterophylla.—Will Mr. Prentice please revise the name of *Lindsæa heterophylla*, published in the last volume of the Journal, p. 295? *Heterophylla* was one of the specific names used by Dryander when he first defined the genus (Linn. Trans., vol. iii., p. 48, t. 8, fig. 1), and this name has been used for a totally different plant from the Australian one by all succeeding writers.—J. G. Baker.

Puccinia Malvacearum.—In reference to Mr. Roper's note in the last volume of the Journal, p. 340, I write to say that when visiting Newbury last month I found *Puccinia Malvacearum* on Mallow. I have seen it also in the churchyard at Ealing, where it was extremely abundant.—E. C. White.

Notices of Books.

Synopsis of the Mosses of Ireland. By David Moore, Ph.D. In Proc. of Royal Irish Academy, Vol. i., ser. ii. (pp. 146.)

We have in the paper before us a great advance beyond the old lists and catalogues which have too frequently been regarded as sufficient to convey all the information required on the vegetation of any particular district or country; and it is, moreover, of interest in being the first attempt to apply the excellent arrangement of Mr. Mitten to our native Mosses.

Possessed of a climate eminently favourable to the growth of cellular plants, Ireland has long been famed for the luxuriance of its Mosses, and for the presence in its flora of some species not met with in other parts of the kingdom, which in a few instances (as is also the case with some of the flowering plants) indicate an affinity to the Mediterranean and Canarian floras.

Nor have workers been lacking to hunt up the bryological treasures of the Green Isle; Dawson Turner in 1804 having given us his "Muscologiæ Hibernicæ Spicilegium," and the indefatigable Dr. Taylor in 1836 the second part of Mackay's "Flora Hibernica." In the latter work 229 species of Mosses are described, and thirty more were recorded as Irish in Wilson's "Bryologia Britannica"; but that Dr. Moore is not behind any of his predecessors in the investigation of the productions of his country, is proved by the addition of 140 species to those recorded in the "Flora Hibernica."

The first portion of the paper is devoted to an analysis of the tribes and genera, the latter having short diagnostic characters founded on the most important points in the structure of the fruit or leaves; then comes a fuller description of the genera, each of which is followed by a diagnostic table of all the species referred to it. The species are not further described, but each is given seriatim, with its principal bibliography and synonymy, and then the localities, which thus afford a guide to the distribution of Mosses throughout Ireland.

A few of the genera are not placed quite in accordance with our views, and these we may notice in passing. *Dicraneæ* is divided into two subtribes—*Bruchieæ*, comprising *Pleuridium*, and *Dicranoideæ*. In the latter we find *Ceratodon*, which we think should undoubtedly be referred to *Trichostomeæ*, for the peristome largely and the areolation entirely accords with those of Mosses in that family; this however does not apply to *C. cylindricus*, which can scarcely be a congener of *C. purpureus*, and if not maintained as a separate genus must be referred to

Dicranella. An additional species of *Campylopus* must be recorded, for according to a specimen in the Wilsonian Herbarium *C. brevifolius*, Schpr. was found by Prof. Schimper in June, 1865, on the bridge by the roadside between Hunting-Tower and Cromagloun; it is a very dwarf species.

The tribe *Grimmieæ* is well represented, but *Campylostelium* we opine should rather find a place near *Seligeria.* In *Trichostomeæ* we find *Splachnobryum Wrightii*, interesting as being one of the few instances where a Cryptogamic plant has become naturalised.* *Didymodon recurvifolius* is not exclusively Irish, but was found on Ben Voirlich in 1863 by the late Mr. McKinlay. Although *Ditrichum* is retained in this tribe, we think its true place will be found to be near *Dicranella* and *Distichium.*

In the tribe *Funarieæ* we also find *Bartramidula*, where it must surely be out of place; except the absence of peristome there is nothing to separate it from *Philonotis.*

Stereodonteæ is maintained as a tribe, comprising *Plagiothecium* and *Cylindrothecium*, while the species of *Stereodon* are left in *Hypnum;* the genus *Stereodon* (of which the common *H. cupressiforme* is the type) is we think very natural, but it may well be left with the other *Hypnaceæ.* Most of the genera detached from *Hypnum* in the "Bryologia Europæa" are here wisely regarded as sections of that genus, for however convenient as indicating natural groups of species, their characters are too trivial to entitle them to generic distinction.

We miss the names of some Mosses which ought to grow in Ireland, and which will doubtless yet reward a more searching investigation of the less explored districts, e.g., *Dicranum virens*, *Grimmia Doniana*, *Aulacomnium androgynum*, *&c.*

In conclusion, we would speak highly of Dr. Moore's work, bearing evidence throughout of industrious research, and an ardent attachment to the study of the interesting little plants which are here so carefully recorded. R. B.

Proceedings of Societies.

ROYAL SOCIETY.—*Nov. 20th*, 1873.—Sir Geo. B. Airey, President, in the chair.—"Note on the Electrical Phenomena which accompany irritation of the leaf of *Dionæa muscipula*," by Dr. Burdon Sanderson. The author repeated the remarks he made at the British Association's meeting (Journ. Bot., 1873, p. 346). When the opposite ends of a living leaf of *Dionæa* are placed on non-polarisable electrodes in metallic connection, and a reflecting galvanometer of high resistance is introduced into the circuit, a deflection of the needle is seen indicating a normal leaf-current from the proximal to the distal end, *i.e.*, from the petiole to the blade. If the leaf-*stalk* is arranged in a similar way (the leaf still connected with it) a current is observed in the opposite direction. The strength of the current is determined by the amount of petiole cut off with the leaf, the shorter the petiole the greater the deflection. If the leaf be so placed in the electrodes that the deflection of the normal leaf-current shall be leftwards, and a fly creep into it, the moment the fly touches one of the six sensitive hairs on the upper surface of the blade, the leaf contracts, the current disappears, and the needle swings to the right *i.e.*, to zero; and each time the insect moves there is a similar movement of the needle to the right, always coming to rest somewhat further to the left than before, and then slowly resuming its previous position. The same phenomena are seen if the sensitive hairs be touched with a camel's-hair pencil, or if the closed leaf be gently pinched with a pair of forceps with cork points. These results are remarkably analogous to those presented by animal muscle, in which the normal current disappears when contraction takes place; a noteworthy difference lies in the fact that muscle will answer to stimuli any number of times in rapid succession, whilst in *Dionæa* no effect is produced unless an interval of from five to twenty seconds has elapsed since the preceding irritation. The period of latency, too, which in muscle is very short, about one-hundredth of a second, is in *Dionæa* about one-third of a second.—In answer to Dr. Hooker, Prof. Sanderson said that no experiments had been made on leaves still unseparated from the plant. These experiments and observations are likely to throw great light upon the nature of contractile material in plants.

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* See Journ. Bot., 1872, p. 193, tab 128.

LINNEAN SOCIETY.—*Nov. 6th*, 1873.—The Society met for the first time in the rooms provided for it in the new buildings at Burlington House—the President, Mr. G. Bentham, in the chair. The President made some observations on the history, condition, and prospects of the Society. Though it is seventeen years since the Government first recognised the claims of the Society, it is only now that it can be considered to possess its own quarters, the rooms occupied in old Burlington House since 1857, when the Society moved from Soho Square, having been lent by the Royal Society. The new rooms form part of the extensive buildings erected from the designs of Mr. Barry for the accommodation of the six chief learned societies; and consist of a fine library, a council-room, meeting-rooms, and quarters for the librarian, &c. The plans were sent some years since and approved of by the Society, and the rooms are fully adequate to its wants. The moving has not been effected without expense, and the classification and arrangement of the books in the new library will necessitate some outlay in binding and to supply gaps. The finances of the Society are, however, in a satisfactory condition, in spite of the constantly increasing expense of the publications of the Society.—Dr. Hooker proposed that the thanks of the Society should be given to H. M. Government for the encouragement given to the Society by the gift of the new rooms, which was duly carried. The following papers were read:—"On *Hydnora americana*, R.Br.," by Dr. J. D. Hooker. The publication of Mr. Miers' paper in this Journal (1873, p. 257, tab. 135A) has redirected attention to the unique specimen of the plant at Kew, shortly described by Brown in 1844. In his monograph of the Order recently published in the 17th vol. of De Candolle's "Prodromus," Dr. Hooker has referred to this plant the *Prosopanche* of De Bary (Abh. d. Naturf. Ges. Halle, Bd. x. (1868) p. 243), founded on a plant from Buenos

Ayres collected by Burmeister, which is not alluded to by Mr. Miers. De Bary's observations are very remarkable, and differ in several points from those of Brown. With a view, therefore, to the settlement of the matter, the Kew specimen was submitted to partial dissection at the hands of Profs. Oliver and Dyer, with the result of confirming in most particulars De Bary's researches. The author therefore regrets that in his monograph above alluded to he did not give sufficient weight to De Bary's accurate investigation, having trusted too entirely to R. Brown's short description. The æstivation of *Prosopanche* is induplicate, the perianth-segments being prolonged inwards so as to form a sort of fold at the base where they commence; in the African *Hydnoræ* they are simply valvate. De Bary describes the staminal column as solid, with the three anthers on its surface; at the base of this are three large canals leading to the tube of the perianth (= cavity of the ovary, Miers), and immediately beneath are three pairs of "staminodes" (= ovuliferous placentæ, Miers). The author had nothing to add to this; the tissue of the "staminodes" could not be determined. Beneath them, in the lower portion of the tube in the Kew specimen, is a hollow cone attached all round to the wall of the tube, but perforated at the summit; no vestige of any such structure is to be seen in De Bary's figures, and the author was inclined to look upon it as abnormal or accidental, perhaps a part of the lining membrane detached. The stigmatic surface is described by De Bary as forming the floor of the tube, and the placenta-plates as passing directly from it straight downwards. The examination of the Kew plant revealed a tissue of some thickness, composed of spherical cells, above the commencement of the plates; the surface had no markings, and the tissues were indistinguishable. Microscopical examination of the placental plates, whilst generally confirming De Bary, showed them to be sinuous instead of straight, on a transverse section, and the ovules are buried *within* the placental tissues as described by that author. In conclusion Dr. Hooker made some remarks on the very anomalous position of the ovules, and suggested that the investment of the ovule in the African *Hydnora*, as figured by Bauer, might be placental instead of seminal.—Mr. Miers gave an account of finding the specimen figured by him; he could not dig up the whole flower, which was buried in stony soil. He gave the specimen to Brown, probably after the publication of his paper on *Hydnora*, or the latter would not have called *H. americana* diœcious. Mr. Miers dissented from the view which regards the three pair of projecting bodies staminodes, considering their position below the "disk" conclusive against it; these are brilliantly white, contrasting with the dark red of the rest of the flower. He thought, too, that the cone which existed above the so-called stigmatic surface must prevent fertilisation, on the theory propounded. As to the "placental plates," he suggested that they were rather radiating stem-structures analogous to those in *Helosis* and *Langsdorffia*.—Dr. Hooker pointed out that the plates were entirely cellular, and in answer to Dr. Trimen stated that in spite of their anomalous position he considered the ovular nature of the immersed bodies established. The structure of the antheriferous column was not examined.—"On a

Dipterocarpus from Cambodia," by Prof. W. T. Dyer. The specimen was collected by Dr. Hance, and was a new type, and most nearly related to Bornean species.

Nov. 20*th*.—G. Bentham, President, in the chair.—Prof. Thiselton Dyer showed a specimen of the fruit of *Luffa ægyptiaca*, the Sooly Qua, grown in this country; also a slab of the wood of *Sequoia* (*Taxodium*) *sempervirens*, the Redwood, grown near Reading. The following papers were read:—"Monte Argentaro, its Flora in July," by Henry Groves of Florence, communicated by D. Hanbury. M. Argentaro is a promontory in the south of Tuscany, connected with the mainland only by two narrow isthmi. The author, accompanied by his wife and Dr. Levier of Florence, first examined the lagoon of Orbitello, in which grew abundance of *Ruppia maritima* and the seaweed *Acetabularia mediterranea*, and which is crossed by a causeway, by which is a nearer approach to the mountain. *Lythrum Græfferi*, *Gastridium lendigerum*, *Teucrium scordioides*, *Salicornia fruticosa*, Bert., *Sonchus maritimus*, and other good plants were collected here. On Monte Argentaro itself occurred *Allium tenuiflorum*, *A. sphærocephalum*, *Micromeria Juliana*, *Daphne collina*, *Osyris alba*, *Sedum altissimum*, *Kundmannia sicula*, *Calycotome villosa*, and many other interesting plants, including *Crepis bursifolia*, L., not before found in Tuscany, and *Ptychotis ammoides*, twenty inches high. At the west end of the isthmus of Feniglia *Cladium Mariscus* was observed nine or ten feet high, with panicles occupying three feet of stem, and *Cyperus longus* much taller. *Erythræa spicata* and *E. ramosissima*, *Euphorbia pubescens*, *Juncus Holoschænus*, &c., occurred here; and on the slopes above were gathered *Coronilla cretica*, also new to the Tuscan Flora, *Bonjeania recta*, *Lonicera implexa*, *Juniperus Oxycedrus*, *Daphne Gnidium*, and others. The sands produced *Anthemis maritima*, *Matthiola sinuata*, and *Glaucium flavum*. The fine reed *Ampelodesmos tenax* was also noticed, and by the roadside towards Port' Ercole *Vitex Agnus-Castus* and *Cercis Siliquastrum* perfectly wild. Torre dell Avvoltore was next visited; here *Passerina hirsuta*, *Psoralea bituminosa*, *Crupina vulgaris*, &c., grew amongst *Pistacia Lentiscus*, *Arbutus Unedo*, *Erica multiflora*, *Quercus Suber*, &c. A bush of *Spartium junceum* was noticed eight or ten feet high, with a well-defined trunk, and *Erica arborea* here becomes a tree with a stem eight inches in diameter. *Chamærops humilis*, the only European Palm, grows among the rocks down the cliff facing the sea; it is locally called "Palma di San Pier Martire," and the leaves are employed to tie round the olive wands used on Palm Sunday. This Palm was known to grow in the Maremma of Siena as long ago as the time of Matthioli, who states that baskets and dusting-brushes were made of its leaves, and the "brain" or pith taken from just above the crown of the root was eaten after dinner with pepper and salt; the plant is so hardy as to put out new stems even after such treatment. *Juniperus phœnicea*, *Stipa tortilis*, and *Onopordum illyricum*, sometimes eight feet high, grow on the same cliff. The next day *Serratula cichoracea* was gathered near the Passionist convents on the hill, and near the small convent grew *Biscutella lævigata*, var. *intermedia*, nob., a form adopted by the plant when growing near the sea, a rare occurrence.

At the east end of the isthmus of Feniglia were found *Helichrysum Stæchas*, *Euphorbia Pinea*, and *Statice psiloclada*, with *Daucus gummifer*. The maritime *Dauci* of Italy are very perplexing, each locality having apparently its own form; the author is inclined to place all under *D. maritimus*. On the shore were noticed thousands of curious felt-like balls, in size from a pea to a child's head, which are formed by the fibres from the base of the stem of *Posidonia Caulini*, rolled by the wind and waves. Many rare plants were collected here, including *Orlaya maritima*, *Vicia dasycarpa* and *V. pseudocracca*, and *Juniperus macrocarpa*, ten to twelve feet high. On the side of M. Argentaro near Porto San Stefano, *Centaurea melitensis* was collected, hitherto only known as Tuscan from occurring in the islands. The Samphire is eaten here as in England, under the name of "Bacicci."—Rev. C. A. Johns showed drawings of the peculiar germination of *Delphinium nudicaule* in which the petioles of the cotyledons remain fused, forming a tube, and the plumule makes its way through a chink in the side.*—"On the Algæ of Mauritius," by Dr. Dickie. The total number of species recorded is 155, of which 17 are European, 23 South African, 12 Australian, 15 East Indian, 14 found in the Red Sea, whilst 12 are peculiar to the island."—"On the Algæ of St. Thomas and Bermuda," by H N. Moseley. These were collected during the explorations by the *Challenger*.—"Supplementary Notes on the Buds on the Leaf of *Malaxis*," by Dr. Dickie.—"On a luminous Fungus on the Leaves of *Spermacoce* at St. Kitts, W Indies," by C. H. Broome. Considered by Mr. Berkeley to be a *Didymium*.

December 4*th*.—G. Bentham, President, in the chair.—Dr. Hooker exhibited a photograph, sent by Dr. Scheffer, of the flower of *Rafflesia Arnoldi*, from a cultivated specimen in the Buitenzorg Gardens, Java. The segments of the perianth are more revolute than is represented in Bauer's well-known and very accurate drawing.—Dr. Trimen showed specimens of *Rumex maximus*, Schreb., collected near Lewes by the Hon. J. L Warren, where it was found many years since by the late Mr. Borrer, and consided a variety of *R. Hydrolapathum*. [We shall in a future number give a drawing and description of this long overlooked British plant.]—"Revision of the Genera and Species of Tulipeæ," by Mr. J. G. Baker. This is a continuation of a general monograph of the Liliaceæ, of which two parts have already been laid before the Society. Defining Tulipeæ as caulescent capsular Liliaceæ with free perianth-segments and bulbous root-stocks, the author pointed out that in the structure of the anther the tribe connects typical Liliaceæ with Colchicaceæ. In all the Tulipeæ the slit is strictly lateral, the attachment of the anther being basal in Tulipa, Erythronium, Lloydia, and Calochortus, but the filament being fixed to the face of the side nearest the centre of the flower in Fritillaria and Lilium, a structure identical with that of the genus Colchicum itself. In reviewing the range of characters presented by the tribe, he dwelt particularly on the structure of the bulbs. All the Tulipeæ are able in a state of nature to hold their ground in the world by bulb-reproduction alone; but in the manner in which the reproduction takes place, and in the number, structure, and function of the leaf-scales composing the bulb, there is great diversity. Four leading types may be traced. First, the squamose perennial bulb of the Old World Lilies. In this there are many flattened scales, all thickened, and all possessing potentially the faculty of developing a new flower-stem in their axils. In this type the new flower-stem strikes up from the centre of the old mass, and there are no dry thin outer tunics. Two striking varieties of this type are furnished by the American Lilies. In one the bulb is perennial, but there is a short oblique central rhizome which throws the scales out of their regularly spiral arrangement; and there is a second subtype in which the bulb is only annual, and produces on its outside a rhizome, at the end of which a new bulb is developed. Instances of these two subtypes are furnished by *Lilium Humboldtii* and *canadense*. The second type is that of the European Fritillaries, in which there are two or sometimes three or four thickened nutritive leaf-producing hemispherical scales, from the axil of one of which the new flower-stem is developed just as in the first type; but here there are a few thin dry tunics on the outside which never fulfil any nutritive function. This type slides gradually into the first through the American Fritillaries and the Crown-Imperial. The third type is that of the Tulips, in which there are several thin laminated nutritive scales, and outside them several thin brown scariose tunics. Here the new flower-stem is developed outside the mass formed by the old nutritive scales every year; the length of time which is required for a new bud to grow up into a flower-stem being three years as in the Lilies. The fourth type is illustrated by Erythronium and Gagea, in which the base only of a single leaf is thickened and nutrient; those on the outside being thin and permanently scariose. In Gagea the bulb of the new year is sometimes clearly visible on the side of the old one at the flowering time. This is not the case in *G. lutea*, but is clearly seen in *arvensis* and several other European species, in which the new bulb has already grown up to bear a leaf when the old stem is in flower. In *Erythronium pullulans* a rhizome strikes out from the stem nearly at the surface of the soil, some distance above the old corm, and bearing downwards grows into a new root-stock at its tip. Of the genera adopted in Kunth's Synopsis, Mr. Baker advocated the merging of Cyclobothra in Calochortus, of Orithyia in Tulipa, and of Petilium and Rhinopetalum in Fritillaria. His synopsis included 180 species, very few of which are here named for the first time. This tribe like Allieæ, unlike most of the other divisions of Liliaceæ, belongs strictly to the north temperate zone. One of its members, *Lloydia serotina*, one of our rarest British plants, has the widest distribution of all the Liliaceæ.

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* See Journ. Bot. 1872, p. 45, for other cases of a similar peculiarity.

Botanical News.

ARTICLES IN JOURNALS.

Ann. des Sc. Nat. (ser. 5, t. xviii., n. 1—3, Sept., 1873).—B. Renault, "Researches on the Organization of *Sphenophyllum* and *Annularia*."—G. de Saporta, "Revision of the Flora of the Gypsums of Aix, 1st Suppt."—P. Dehérain, "Researches on the Relations of atmospheric Nitrogen to Vegetation."—E. Bescherelle, "Bryological Florula of New Caledonia."

Flora (October).—A. Batalin, "On the Causes of Periodical Movements of parts of the Flower and Leaves."—C. Haussknecht, "On the Species of *Fumaria*, sect. *Sphærocapnos*, DC." (contd.) (Cambridge *F. Vaillantii* referred to var. *Laggeri*, Jord. sp.).—A. v. Krempelhuber, "Chinese Lichens."

NOVEMBER.

Monthly Micr. Journ.—F. Kitton, "New Species of *Diatomaceæ*" (*Aulacodiscus superbus*, *Stictodiscus Crosieri*, *Isthmi*? *vitrea*, *Nitzschia ventricosa*, *N. decora*, *Tryblionella conspicua*. Tab. 28).—W. Carruthers, "*Nematophycus* or *Prototaxites*."—R. Braithwaite, "*Sphagnum rigidum*, Sch. (tab. 29), *S. molle*, Sull. (tab. 30)."

Grevillea.—M. J. Berkeley, "Notices of North American Fungi" (contd.).—J. Stirton, "Additions to Lichen-Flora of Great Britain." —J. M. Crombie, "Note on *Solorina bispora*, Nyl."

American Naturalist.—S. Watson, "On the section *Avicularia* of the genus *Polygonum*" (N. American species; *P. Torreyi*, n.s.; *P. californicum*, Meisn., referred to new section *Duravia*).

Bull. Bot. Soc. France (t. xviii., p. 2)—D. Clos, "On some Plant-names."—Duby, "New Genus of Mosses from New Caledonia" *Bescherellia*, tab. 1).—C. Roumeguère, "New Locality for *Clathrus cancellatus* and *hirudinosus*."—A. Fée, "On Taxonomy of Ferns."—J. Duval-Jouve, "On Two Grasses of environs of Montpellier."—H. A. Weddell, "Lichens of the Granite of Ligugé."—J. Decaisne, "Three New Genera collected by A. David in China" (*Ostryopsis*, Corylaceæ; *Camptotheca*, Nyssaceæ; *Bernauxia*, Diapensieæ).—E. Mer, "Glycogenesis in the Vegetable Kingdom."—E. Prillieux, "On the Colour and Viridescence of *Neottia Nidus-avis*." — M. Cornu, "New Species of *Enteromorpha*" (*E. Planchoniana*).—P. Chapellier, "On the Origin of *Crocus sativus*."

Ann. des Sc. Nat. (ser. 5, t. xviii., n. 4—6).—A. Crié, "De *Phyllosticta cruenta* Distributione Geographica."—E. Fournier, "Filices Novæ Caledoniæ, Enumeratio Monographica" (36 new species; *Fourniera*, Bommer, n. g.).—F. W. Klatt, "On some *Compositæ* of Senegal, Madagascar, Bourbon, &c." (19 new species).—J. Boussingault, "On the Rupture of the Pellicle of Fruits exposed to continuous Rain."

Flora.—K. Müller, "Six New North American Mosses."—C. Haussknecht, "On the Species of *Fumaria*, sect. *Sphærocapnos*, DC." (*F. Janka*, n.s.).—S. Dippel, "The New Objective-System of Carl Zeiss and Prof. Abbes' Illuminating Apparatus" (tab. vi A.).—A.

Geheeb, "*Barbula sinuosa*, Wils., a new member of the German Moss-Flora."—J. Müller, "*Lysurus Clarazianus*, Mull. Arg." (tab. vi. B.)—F. Arnold, "Lichens of the French Jura."

Hedwigia.—G. v. Niessl, "On *Sordaria appendiculata*, Auersw., and *S. Curvula*, De Bary."

Bot. Zeitung.—P. Ascherson, "On *Hymenophyllum tunbridgense; on Hydnora americana*, R. Br., and *Prosopanche Burmeisteri*, De Bary" (see p. 26).—M. Treub, "Cultivation of Lichens" (tab. viii. A.).—R. A. Philippi, "On Chilian Species of *Edwardsia* (tab. viii. B., 4 new species).—O Uhlworm, "On the Development of the Trichome, with special reference to Prickles" (tab. ix. and x.).

Oesterr. Bot. Zeitschr.—A. Val de Lievre, "Notes on *Ranunculaceæ*, &c." (contd.).—R. de Uechtritz, "*Geranium ruthenicum*, sp. nov."—L. Celakovsky, "Phytographical Contributions; *Pastinaca urens*, Reg."—H. Kemp, "Supplement to Flora of neighbourhood of Vorarlberg."—R. v. Uechtritz, "Notes on Schultz and Winter's Herb. Normale."

Botaniska Notiser (15 Nov.).—A Blytt, "*Plantago borealis*, Lange, a new Scandinavian Plant."—J. Eriksson and S. A. Tullberg, "Notes on Flora of Scania."—Swedish and Danish Botanical Literature, 1872; Finnish ditto, 1871-72.

New Books.—A. Franchet and L. Savatier, "Enumeratio Plantarum in Japonia Sponte Crescentium," vol. i., pt. 1. *Ranunculaceæ—Araliaceæ.* (Paris, 1874. 7s. 6d.).—J. A. van Bemmelen, "Repertorium annuum Literaturæ Botanicæ periodicæ," vol. i., 1872. (Haarlem, 1873. 3s. 6d.)

Dr. A. Gray's Botanical Contributions to the Proc. of the American Academy for 1873 consist of descriptions of new genera and species of North American plants, chiefly Mexican and Californian. *Brewerina* is a new genus of Sileneæ from the Sierra Nevada, dedicated to Prof. W. H. Brewer, of Yale College; *Ghiesbreghtia* belongs to Scrophulariaceæ, and is named after Dr. Ghiesbreght, who collected it in Mexico. The notes on Compositæ which follow are a sort of commentary on Mr. Bentham's recent work on the order. A revision of the genus *Bigclovia*, DC. (*Chrysothamnus* Nutt.) is given, and *Mesoneuris*, a new genus of Senecionideæ from Mexico, described.

In electing Dr. Hooker to the presidency of the Royal Society, that body has shown its sense of the value of his scientific work and public services, and has paid him the highest honour in its power. Botany is honoured, too, in the appointment; and with a naturalist in the chair—the first since Sir Joseph Banks—there will be no danger of the biological sciences being neglected for the physical ones.

A notice has been sent to the members of the Botanical Exchange Club stating that the ill health of Dr. Boswell-Syme, the Curator, has hitherto prevented the issue of their return parcels this year, as well as the publication of the report for 1872, but that it is hoped that both will shortly be effected. It is further proposed that the operations of the club be now suspended for one year, *i.e.*, till the end of 1874, when Mr. Duthie, who will then be a resident in Edinburgh, has undertaken to assist the present Curator in his labours.

Original Articles.

ON THE GREAT WATER-DOCK OF ENGLAND.

By Henry Trimen, M.B., F.L.S.

(Tab. 140.)

Again, through Mr. Warren's skilled acuteness in the field, I am able to place another *Rumex*—*R. maximus*, Schreb.—on the British list. As in the case of *R. sylvestris*, figured and described in the last volume (p. 129, t. 131), so in the present communication the object aimed at is rather to incite English botanists to a closer study of these perplexing plants, and to call attention to the range of form assumed by some common and neglected species, than to affect to add to our flora "a new British plant."

The great Water-Dock has always been a familiar plant to the botanists of this country. It was well understood by Gerard, Parkinson, Ray, Petiver and others, as is seen from their descriptions and specimens, though their rough figures are, except that of Petiver, unsatisfactory. From the root having been considered a drug of some importance, the plant was more generally familiar. As we so frequently notice in tracing the history of the knowledge of British plants, the writings of Linnæus, founded on too scanty material and with imperfect and brief descriptions, instead of simplifying matters led for a time to confusion. It is not very clear what Linnæus did with the plant, which he must have known, in his "Species Plantarum"; probably he included it under his *R. aquaticus*, where he quotes Munting's figure, which is no doubt our plant. In the same standard book, however, Linnæus named a North American species collected by Clayton *R. Britannica*,* and Hudson, when in the first edition (1762) of his "Flora Anglica," he tried, as in duty bound, to fit all our plants to Linnæus' names, not unnaturally though erroneously referred the great Water-Dock to this unfortunately-named species. He corrects himself, however, in his second edition (1778), where he bestows upon it as a specific name the old title of *Hydrolapathum*.

Schreber in 1804, in the addenda to Schweigger and Körte's "Flora Erlangensis," defined a Dock which differed from *R. Hydrolapathum* in the obliquely ovate or cordate base of the root-leaves and the denticulate and cordate petals, and which he named *R. maximus*. The plant with these characters has been generally recognised on the Continent, and is almost universally—except by those botanists who, as will be presently noticed, consider it a hybrid—accorded the rank of a species.

In bringing this form before the notice of English botanists, it must be remembered that I am only re-introducing an old acquaintance. So long back as 1843, in the first edition of his "Manual," Prof. Babington stated that a plant in the possession of Mr. Borrer, "from Lewes in Sussex, will probably prove to be *R. maximus*, Schreb."; and although from the omission of the observation in the second and all subsequent editions we may suppose some doubt to have been felt, yet after the lapse of thirty years its correctness has been established. It is rather remarkable that the plant should for so long have dropped out of notice; the specimens are still in Borrer's herbarium, now public property at Kew, yet even Mr. Hemsley in his papers on Sussex botany has taken no note of them, and indeed the only remark in British books about the plant is the formula, "Error —a misnomer?" with which Mr. Watson disposes of *R. maximus* in his "Compendium" (p. 556).

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* Dr. A. Gray has only recently satisfactorily determined this to be the plant called by him in his "Manual" *R. orbiculatus* (see Journ. Bot. 1872, p. 211).

Last summer Mr. Warren, having had his attention previously directed to the matter, carefully searched the neighbourhood of Lewes—a grand locality apparently for Docks—and had the satisfaction of finding the plant of which a specimen is here figured. This agrees with the characters of *R. maximus*, and with Continental specimens so named, and is the same—as we have together determined—as the specimens in Borrer's herbarium (some of which were gathered by Joseph Woods) collected in several places near Lewes in 1843-49.

The characters by which *R. maximus* differs from *R. Hydrolapathum* are, I believe, confined to the perianth, the fruit, and the root-leaves. The following description of these points is taken entirely from Mr. Warren's Lewes plant:—*Fully ripe inner perianth-leaves* triangular or triangular-ovate with a rounded or slightly cordate base, blunt at the apex, variable in size, the largest as broad as long, about $\frac{1}{4}$ inch each in diameter, the smallest about $\frac{3}{16}$ long by $\frac{1}{8}$ wide, strongly and prominently veined, always denticulate in the lower half, but the denticulations varying from well-marked triangular teeth to mere prominences formed by the veins running out beyond the margin, all tubercled, tubercles $\frac{1}{3}$-$\frac{3}{4}$ as long as the perianth-leaves. *Nut* broader in proportion to length than in *R. Hydrolapathum*, about $\frac{1}{8}$ inch long by $\frac{1}{10}$ wide. *Root-leaves* broader and shorter than in *R. Hydrolapathum* (in the specimens 13-16 inches long by 4-6 wide), ovate, abruptly rounded, or even slightly cordate at the base, with the two sides unsymmetrical, never attenuated into the leaf-stalk.—These points are shown in the figure, where details of *R. Hydrolapathum* have been added for the sake of contrast, the whole carefully drawn to scale. I have not had the opportunity of seeing the plant alive, but the branches are said to be more divaricate and the whorls less dense than those of the common plant, and the colours of the leaves and root to differ from those in the latter.

Though extremes purposely selected—as those figured—show conspicuous differences, a comparative study of many specimens prevents me from considering the two plants distinct. Whether when growing they present stronger differences I cannot say, but in the herbarium, specimens can be readily found which appear to occupy quite an intermediate position, or even a series which will bridge the extremes. As, however, *R. maximus* occupies the rank of a species in the works of such botanists as Fries, Koch, and indeed nearly all Continental writers, it will be proper to say a little more on the value of the characters above given. None of them, I think, can be held to be in this genus of very great importance. As to the denticulation of the petals, short triangular (not setaceous) toothing not unfrequently occurs in other usually entire-petalled species, e.g., *R. crispus*, and it has been shown that species which normally exhibit such denticulations have toothless varieties, e.g., *R. obtusifolius*; the slight importance of the character is further indicated by its great difference in degree even in the same whorl of flowers, where may be found every gradation down to almost complete entireness. The form of the base of the root-leaves has been much used as a character to separate nearly allied species in this genus, but is, taken alone, quite insufficient; tapering and abruptly rounded bases are certainly found in the same species, e.g., *R. palustris*, without being correlated with any other differences. It must be admitted, however, that the contrast in this respect between well-marked *R. Hydrolapathum* and *R. maximus* is very striking, the unequal base of the latter being especially remarkable.*

The following is the synonymy, with references to figures:—

R. HYDROLAPATHUM, *Huds. Fl. Ang., ed. 2, p.* 154 (1778); Meisn. in DC. Prod. xiv., p. 47.
Lapathum magnum, Ger. emac., 389, et alior.
Lapathum maximum aquaticum seu Hydrolapathum, Ray, Syn., ed. 3, p. 140, et alior.
Britannica antiquorum vera, Munting, De vera Herba Brit., p. 14.
R. Britannica, Huds. Fl. Angl., ed. 1, p. 135 (non L.).
R. aquaticus, Smith, Fl. Brit., p. 394, et auct. plur. (non L.†)
Tab.—Munting l.c., t. 1; J. Bauhin, Hist. Plant. i., p. 987; Petiver, Herb. Brit. Cat., t. ii., f. 1; Woodville Med. Bot., ed. 3, t. 229?; E.B., t. 2104, reprod. Syme E.B. viii., t. mccxx (bad); Leight. Fl. Shropsh., p. 153 (details); Fl. Dan., t. 2348; Reichenb. Icon. Bot., t. 370; Sturm, Deutschl. Fl., bd. 17, hft. 73, n. 15; Hayne, Darst. & Beschr. Arzn. Gew., bd. 13, t. 4, fig. dextra.

Var. β. latifolius, Borrer MS. in herb.
R. maximus, Schreb. in add. Schweigg. & Koerte, Fl. Erlang. i., p. 152 (1804); Meisn. l.c., p. 48.
R. aquaticus, Campd. Rum., p. 100, fide Meisn. l.c. (non L.†)
R. heterophyllus, Schultz, Fl. Starg. Supp., p. 12.
R. acutus, Palmstruch, Svensk. Bot., 161 (non L.)
R. Hydrolapathum × *aquaticus*, Ascherson, Fl. Brand., p. 585; G. W. F. Meyer, Fl. Hannov., p. 458; et alior.
Tab.—Fl. Dan., t. 2347; Sturm l.c., n. 16; Svensk. Bot., t 161.

R. Hydrolapathum proper is a common plant through Central and Northern Europe, probably reaching into Asia, but does not extend to the far north, where its place is occupied by *R. Hippolapathum* and *R. domesticus*. Of numbered collections, it is found in Billot, n. 3768 (Strasbourg), Herb. Fl. Ingricæ, n. 532 (St. Petersburg), Fries' Herb. Normale, f. 6, n. 52 (Stockholm, a plant with intermediate characters approaching *R. maximus*). In England it is frequent in the south, but does not get further north than Ayr and Perth. *R. maximus*, though apparently always a less common plant than the type, seems to have a wider range. In addition to many European specimens, I have seen what I believe to be the same plant from the widely distant stations of Formosa (Oldham, n. 439) and the Azores (Hunt., n. 216[*]). It is also recorded from the Cape Verd Islands (Schmidt Fl. Cap. Verd, p. 178), and doubtfully from America. In this country it has hitherto been observed only in Sussex (Woods !, Borrer !, Warren !) and Surrey (Cut Mill Pond, Warren !).

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* It is worth noticing here that, alone of British handbooks, the "Student's Flora" of Dr. Hooker (p. 312) gives such a definition of the leaves of *R. Hydrolapathum*, "rounded, cordate, or acute at the base," as will include under the species also *R. maximus*.

† *R. aquaticus* of Linnæus probably, as Fries considers, included *R. Hydrolapathum*, *R. maximus*, *R. domesticus*, and *R. Hippolapathum*; there can, however, be little doubt that the last-named was the plant chiefly in view. But it is surely better to abandon the use of *aquaticus* as a specific name in the genus.

This notice would be imperfect were no reference made to the view held by many Continental botanists of eminence that *R. maximus* is a hybrid between *R. Hydrolapathum* and *R. Hippolapathum*. This opinion, expressed by G. F. W. Meyer, Ascherson, and other German writers, has been supported by Crépin, after an elaborate comparative examination of the plants, the details of which are given at great length in his "Notes," fasc. v., pp. 78-90. The French botanists generally do not maintain the hybrid theory.

As one of the presumed parents, *R. Hippolapathum*, does not occur in this country, the question may be decided so far as the alleged parentage is concerned. Even if English *R. maximus* be a hybrid, *R. Hippolapathum* cannot be one of its progenitors, and it is difficult to suggest any other cross with *R. Hydrolapathum* likely to result in the plant. But so far as our material goes at present, the facts seem to be met and explained better by considering *R. maximus*, as I have done above, to be a variety of the commoner species. Crépin states the flowers to be very frequently abortive and sterile, but this is not the case in Mr. Warren's specimens, in which the nuts are abundantly produced, and apparently healthy and fully developed. But the determination of the fact of hybridity in wild plants is well nigh impossible without experimental cultivation for a series of years.

EXPLANATION OF TAB. 140.

Rumex maximus, Schreb., from specimens collected by the Hon. J. L. Warren near Lewes, Sussex, in 1872. Fig. 1. Inner perianth segment; 2. Enlarged perianth with fully ripe fruit; 3. Nut; 4. Outline of one face of nut; 5. Root-leaf, ⅕ nat. size. (1a, 2a, 3a, 4a, 5a. The same parts of *R. Hydrolapathum*, Huds.) All the details × 4 diam.

THE MOSSES OF BUDDLE'S "HORTUS SICCUS"

EXAMINED AND DETERMINED BY S. O. LINDBERG, M.D.

[THE herbarium of the Rev. Adam Buddle was formed during the end of the 17th and beginning of the 18th century. The specimens, in accordance with the usual practice at that period, are fastened into folio books, several kinds being crowded into a page in no strict order. The whole British collection consists of 13 volumes, and the Mosses are contained in vol. ii., occupying folios 14 to 36. Each page (folio) is numbered, and under the specimens Buddle has written the names and other information. There is besides another volume, forming no part of the consecutive series, which contains on folios 1 to 9 a collection of Mosses; these, which were perhaps collected at an earlier date than the others, are usually better specimens and more carefully mounted then them, but are, with five or six exceptions, duplicates.

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[*] This is in the Kew Herbarium, and an immature specimen. It is the plant named *R. Caldeirarum* by Watson, which Meisner (l.c., p. 43) refers to *R. aquaticus*, L. (= *Hippolapathum*, Fries). In the same herbarium Areschoug has inadvertently misnamed "*R. maximus*" a specimen from Kew Gardens which is certainly not that plant, and perhaps *R. Patientia*.

Buddle died in 1715,* and left his herbarium to Sir Hans Sloane, of whose valuable "Hortus Siccus"—the original "National Herbarium"—still preserved intact in the British Museum, it forms vols. cxiv. to cxxv; the collection of extra Mosses is in vol. liv. of the series. Each specimen has been numbered by Sir Hans Sloane and others to facilitate reference.

The text-book of English botanists in Buddle's days was the second edition of Ray's "Synopsis," published in 1696, and the names used in this herbarium are mostly those of that excellent British Flora; Buddle, however, made numerous additions to our Moss-flora, in which group he was especially skilled. His collection of these plants was indeed considered the best of the time, and was lent to Tournefort at Paris, and to Petiver, Bobart, and others, in England. Bobart's letter of thanks, inserted in the volume, is well worth publication. "Oxon, April, 4, 1707.—Sir, I am now to be thankfull to God and my Friends that I have not only seen, but had the perusall of (as I think) the best collection of its kind in the world, and is as instructive as admirable: if the intellectuall is the best part of mankind certainly whosoever contributes to that is the most amiable and performs the greatest part of humanitie. I return your Book of Mosses with as many thanks as there [are] leaves among the said Mosses; to which I have sometimes added a plant and sometimes a note, which I offer to your maturer judgment, to be ejected at pleasure; if anything of my endeavours proves pertinent, I have my aime. You will, Sir, easily find my imperfections and defects by this inclosed long Bill,† any of which if to be spared, would prove very acceptable to my small collection, and heartily give thanks that you have been pleased to open our eyes that we may the better discover the wealth of our owne country, I being now sensible that we have passed over diverse without sense of distinction. I hope you will safely receive your Book sent by Mrs. Bartlet to the Swan at Holborn bridge carraige-paid; and if your candour will prompt you to excuse the Libertie I take by this inclosed note, you will add obligations to, Sir, your most obliged servant, J. Bobart." The specimens added by Bobart to the collection are included in the following enumeration.

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* It will be as well to give here the few additional points which have come to light (mainly through the assiduity of the Rev. W. W. Newbould) relative to Adam Buddle since the publication of my memoir in the "Flora of Middlesex." He was a Fellow of St. Catherine's Hall, Cambridge, and a non-juror, but he afterwards complied. He was presented to the rectory of North Fambridge, Essex, in 1703, and was for many years Reader to Dean Moss, in Gray's Inn, where he died in April, 1715. He was buried on the 15th of that month in the parish church of St. Andrew's, Holborn.—H. T.

† A list of desiderata which accompanies the letter.

Dr. Dillenius of Oxford also had the use of the collection in the preparation of the third edition of Ray's "Synopsis," which he edited and which appeared in 1724; in the preface he thanks Sir H. Sloane for the loan, and acknowledges the great help derived from it, especially in working up the Cryptogams. Many of Buddle's species were here first published by Dillenius, who has usually referred to the "Hortus Siccus" itself.

During the summer of 1872 Dr. Lindberg, of Helsingfors, then on a visit to London, carefully went over the whole of Buddle's Mosses and determined them. In the following enumeration his determinations are given, and in arranging the list for publication the plants have been arranged in the sequence most familiar to British botanists. I have only printed the leading name of Buddle's labels, and it must be sufficient to mention here that they—as well as his MS. Flora, the key and companion to the Herbarium—contain numerous synonyms and localities which it would occupy too much space to transcribe. When readily identified with the published names in the Dillenian edition of Ray's "Synopsis," I have added, in brackets, a reference to the page and number of species in that book (R. Syn. iii.). The folio of Buddle's herbarium is quoted as F; the second figure is the number of the specimen.

Only the probably British specimens are included in the list. Mingled with them the herbarium contains a few exotic and European species from Doody and Petiver.* None of these have been named by Buddle, and though all—as well as many other unnamed specimens—were determined by Dr. Lindberg, it does not seem of any practical use to extend this list by their insertion.—H. T.]

HEPATICÆ.

Riccia natans, L., ster.—L. parvus aquatilis cordiformis ima parte fimbriatus Lentis palustris modo aquis innatans, Budd. F. 15, 9; F. 9, 10. (R. Syn. iii., 116, 2!)

R. fluitans, L., *a.*, ster.—Lactuca aquatica tenuifolia segmentis bifidis, Mus. Pet., f. 253. F. 18, 15.

Fegatella conica, L. (Radd.), c. fruct.—Lichen seu Hepatica vulgaris, R. Syn, p. 40. F. 15, 1; F. 9, 6.—♂.—Lichen verrucosus, Doody, R. Syn., p. 41. F. 15, 4. (R. Syn. iii., 114, 1.)

Preissia commutata (Lindenb.), N.Es., c.fr.—Lichen petræus cauliculo longo pileolum parvum sustinente, Budd. F. 15, 6. (R. Syn., 115, 2!)

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* On one of these Dr. Lindberg furnishes the following critical note:—*Meteorium tetragonum* (Sw.), Lindb., ster. Budd. Herb. F. 34, 35. "A Jamaica."—Planta humilis, robusta, foliis contracto et sat longe acuteque apiculatis, marginibus superne conniventi-involutis et serratis, nervo simplici, tenui, supra medium semper dissolutis, interdum infra apiculum. His notis specimina ad amussim cum eisdem authenticis *Hypni tetragono* ipsius ill. Swartzii et cum descriptione et delineationibus speciei in Hedw. Sp. Musc., p. 246, t. 63, ff. 1—3 congruunt, sed nullo modo cum diagnosi Cll. Muller et Mitten publice enarrata. Vix dubitanter *Neckera quinquefaria*, C. Mull. Synops. ii. est synonyma cum vero *Meteorio tetragono*, Sw.!

Marchantia polymorpha, L., c.fr.—Lichen petræus stellatus, C. B. F. 15, 2.—L. seminifera pyxide folio adnascente, pilo pediculo longo insidente, D. Robinson, R. Syn., 4. F. 9, 7.—♂—Muscus petræus umbellatus, C. B., R. Syn., p. 40. F. 15, 3; F. 9, 9. (R. Syn. iii., 115, 5.)

Lunularia vulgaris, Mich., ster. et propagulif.—L. seu Hepatica lunulata ἐπιφυλλόκαρπος, D. Dale, R. Syn., p. 41. F. 15, 5. (R. Syn., 115, 5.)

Metzgeria furcata (L.), N.Es., ster.—L. parvus repens fol. angustis non squamosis ceranoides, Budd. F. 17, 15.—M. lichenoides parvus corticibus arborum adnascens foliolis angustis non squamosis, Budd. F. 16, 3; F. 9, 4.

Aneura pinnatifida (Sw.), N.Es., ster. & gonidiifera.—"Lactuca aquat. tenuifolia segmentis bifidis, Petiver," Bobart MS. F. 15, 10 & 11.

Pellia epiphylla (L.), Radd., var. *furcata*, N.Es., ster.—L. parvus erectus foliolis profunde laciniatis, Pluk. Phyt., t. 42, f. 2. F. 15, 8. (R. Syn. iii., 110, 4.)

P. calycina (Tayl.), N.Es., c.fr.—L. petræus calceato, C. B., R. Syn., p. 41. F. 15, 7; F. 9, 8. (R. Syn. iii., 110, 3.)

Frullania dilatata (L.), N.Es., colesulif.—M. lichenoides foliis cauli squamatim incumbentibus angustis, Doody in app. R. Syn., p. 339. F. 16, 4; F. 9, 1. (R. Syn. iii., 111, 11.)

Madotheca platyphylla (L.), Dum., α., c.fr.—M. muralis platyphyllos, D. Bobart in R. Syn. 22.—M. terrestris squamosus elegans in humidis nascens surculis et foliis Thujæ instar compressis, R. Syn., 39. F. 16, 1, ster.; F. 9, 3, c.fr. (R. Syn. iii., 111, 10.)

M. Thuya (Dicks.), Dum., ♀, ster.—M. trichomanis facie minima fol. rupium fissuris denso cespite proveniens, D. Richardson, Bob. Hist. Ox., 627. F. 8, 13.

Radula complanata (L.), Dum., c.fr.—Lichen parvus in corticibus arborum humidis repens fol. subrotundis squamatim incumbentibus, R. Syn., 41. F. 16, 2; F. 9, 2. (R. Syn. iii, 111, 10.)

Trichocolea tomentella (Ehrh.), Dum., ster.—M. filicinus perelegans crispatus, D. Dandridge, Mus. Pet. 43, 8. F. 16, 5; F. 9, 5. (R Syn. iii., 111, 7.)

Physiotium cochleariforme (Hook.), N.Es., ster.—M. trichomanoides purpureus alpinis rivulis innascens, D. Lhwyd, R. Syn., p. 40. F. 16, 13. (R. Syn. iii., 112, 17.)

Mastigobryum trilobatum (L.), N.Es., ster.—M. trichomanoides viticulis brevibus crassis semel interdum divisis, Budd. N.D. F. 17, 10; F. 8, 14.

Lepidozia reptans (L.), Dum., ster.—M. seu L. perexiguus eleganter squamosus et ramosus terra fibrillis adhærens, Budd. F. 16, 9.

Calypogeia trichomanis (L.), Corda., ster.—A Buddle coll. inter muscos pal. repens. F. 17, 6.

Lophocolea bidentata (L.), Dum.—M. lichenoides fol. pennatis bifidis major, Doody in app. R. Syn., 339. F. 17, 4, c. infl. ♀; F. 8, 9, ster. (R. Syn. iii., 113, 19.)

Chiloscyphus polyanthus (L.), Cord., α., ster.—M. polytrichoides pellucidus fere fol. denticulatis ad margines veluti crispis, Pl. Phyt., t. 98, 8. F. 17, 8.—Var. β. *pallescens* (Ehrh.), Carringt., ster.—

Lichen minimus albescens cauliculis reptans fol. pinnatus, capitulis nigris lucidis, R. Syn., p. 41. F. 17, 7. (R. Syn. iii., 113, 22.)

Jungermannia bicuspidata, L., c.fr.—M. lichenoides fol. pennatis bifidis minor, Doody in app. R. Syn., 339. F. 17, 9; F. 8, 12. (R. Syn. iii., 113, 20.)

J. Taylori, Hook., ♂ et colesulif.—"M. trichomanis facie species minima fol. crispis a rupium fissuris denso cæspite proveniens.—D. Richardson, 43. Hist. Ox., 627," Dr. Richardson MS. F. 17, 12.

J. albicans, L., c.fr.—M. lich. pennatus non bifidus erectus capitulis quadripartitis e summitate exeuntibus, Budd. F. 17, 13; F. 8, 11. (R. Syn. iii., 113, 23!)

Scapania undulata (L.), Dum., var. *integrifolia*, gonidiifera ster.—M. lich. pennatus non bifidus fol. crebris et confertis fuscis, Budd. F. 17, 14; F. 8, 10.

Plagiochila asplenioides (L.), Dum., forma *major*, ster.—M. polytrichoides fol. latis subrotundis, R. Syn., p. 35. F. 17, 1; F. 8, 7. (R. Syn. iii., 103, 59.)—M. bifolius procumbens fol. subrotundis, Fl. Pruss., 167. F. 17, 5.—Forma *minor*, ster.—M. trichomanoides fol. rotundioribus pellucidis squamatim conjuncte sibi incumbentibus, Bob. Hist. Ox., pl. 627, 42, tab. 6, 125. F. 17, 2.

Alicularia compressa (Hook.), N.Es., var. fol. squarrosulis et basi saccatis ♂ ?.—M. aquat. Cornubiensis plurimum capillaceis fol. exiguis alternis per capillorum longitudinem adnatis, Hist. Ox., 627. F. 17, 11.

Sarcoscyphus emarginatus (Ehrh.), Spruce, ♀.—M. trichomanoideo purpureo Lhwyd similis sed multo minor. F. 16, 12.

SPHAGNINÆ.

Sphagnum cymbifolium, Ehrh., c.fr.—M. palustris albicans terrestris erectis brevibus pediculis etiam brevissimis insidentibus, R. Syn., 37. F. 21, 3; F. 2, 7. (R. Syn. iii., 104, 1.)

S. cuspidatum, Ehrh., var. *plumosum*, c.fr.—M. erectus palustris albus fol. capillaceis, Doody in app. R. Syn. F. 22, 1. (R. Syn. iii., 104, 2.)

BRYINÆ.

1. *Acrocarpi.*

Phascum cuspidatum, Schreb., c.fr.—M. trichoides acaulos minor latifolius, Mus. Pet., f. 86. F. 12, 29; F. 6, 5.

P. subulatum, Bruch. (*P. acuminatum*, Lindb.), c.fr., et *P. alternifolium*, Kaulf. (*P. subulatum*, Huds., Schreb., Hedw., Lindb.), c.fr.—M. trichoides minor acaulos capillaceis fol. Mus. Pet., f. 87, et Doody in app. R. Syn., 339. F. 29, 15; et *P. alternifolium*, Kaulf., c.fr. F. 6, 6.

Gymnostomum squarrosum (N. H. S.), Wils., c.fr.—M. capillaris minimus capitulis subrotundis erectis in pediculis brevissimis, R. Syn., 30. F. 19, 6. (R. Syn. iii., 94, 9.)

Weissia cirrhata (L.), Hedw., c.fr.—M. trichoides minor vulgaris fol. capillaceis, Mus. Pet., f. 88. F. 31, 8; F. 6, 15.

W. viridula (L.), Brid., perist. pessime evoluto.—M. capillaris minimus capitulis subrotundis erectis in pediculis brevissimis, R. Syn., 30. F. 31, 11. (R. Syn. iii., 94, 9 in part.)—Perist. optime evoluto.—" M. coronatus minimus capillaceis foliis capitulis oblongis, Hist. Ox., 631. Mus. Pet.," Bobart MS. F. 31, 12.

Dicranum scoparium (L.), Hedw., c.fr.—Adiantum aureum medium fol. tenuissimis capitulis erectis acutis, D. Bobart in app. ed 1. R. Syn., 227. F. 30, 2; F. 7, 1. (R. Syn. iii., 95, 14.)—c. setis.—Lichen capillaceo fol. elatior pelv. ruberrima, Tourn. Inst., 550. F. 32, 11.

D. squarrosum, Stark, ster.—M. trichoides pal. capitulis erectis fol. reflexis, D. Richardson in app. R. Syn., 338. F. 30, 5. (R. Syn. iii., 95, 18.)

D. heteromallum (L.), Hedw.—M. trichoides fol. capillaceis capitulis minoribus, Doody in app. ed. 1 R. Syn. F. 6, 17, c fr.; F. 30, 7, forma *brachycarpa*, c.fr. (R. Syn. iii., 96, 23.)

D. pellucidum (L.), Hedw., var. *flavescens* (Dicks.), c.fr.—An M. capillaris parvus surculis tenuibus longiusculis foliolis brevibus angustis acutis rarioribus cinctis, Dale, R. Syn., 31! F. 30, 10. (R. Syn. iii., 99, 39.)

Leucobryum glaucum (L.), Schimp., ster.—M. trichoides montanus albidus fragilis, Doody in app., 339. F. 21, 5; F. 7, 12. (R. Syn. iii., 97, 29.)

Pottia truncata (Hedw.), Turn., c.fr.—M. trichoides minimus capitulis creberrimis parvis rufis brevibus pyriformibus in pediculis brevissimis, Vernon, R. Syn., 33. F. 31, 10; F. 6, 16. (R. Syn. iii., 94, 9 in part.)—" M. coronatus minimus fol. et capitulis oblongis in pediculis brevissimis, Hist. Ox., 631," Bobart MS. F. 31, 14.

P. lanceolata (Hedw.), C. Müll., forma paupera, seta brevis, theca interdum obliquula, peristomio valde rudimentario.—M. capillaris minimus pilosus et veluti bulbosus, Budd. F. 31, 15. (R. Syn. iii., 93, 8!)

P. cavifolia, Ehrh., *a.*, c.fr.—M. perpusillus pilosus et veluti bulbosus, Budd. N.D. F. 6, 20.

Ceratodon purpureus (L.), Brid., c.fr.—M. trichoides parvus fol. musci vulgaris capitulis longis acutis, Doody in app. ed. 1 R. Syn. F. 31, 6; F. 7, 5. (R. Syn. iii., 99, 41.)—" M. trichoides terrestris minimus capitulis recurvis, Hist. Ox., 629," Bobart MS. F. 31, 16.

Tortula ruralis (L.), Ehrh., c.fr.—M. capillaris tectorum densis cæspitibus capitulis oblongis fol. in pilum oblongum desinentibus, R. Syn., 28. F. 31, 1. (R. Syn. iii., 94, 10.)

T. muralis (L.), Hedw., c.fr.—M. capillaris minor capitulis erectis vulgatissimus, R. Syn., 28.—M. trichoides parvus capitula oblonga erecta habitiora per siccitate atrorubentia producens, Vernon, R. Syn., 33. F. 31, 2; F. 6, 11. (R. Syn. iii., 94, 11.)—M. capillaris tectorum densis cæspitibus capitulis oblongis fol. in pilum oblongum desinentibus, R. Syn., 28. F. 6, 8.

T. lævipila (Brid.), Schwaegr., c.fr.—" M. coronatus minor fol. longis tenuissimis capitulis oblongis erectis, Hist. Ox., 631," Bobart MS. F. 31, 3.

T. intermedia (Brid.), Wils., c.fr.—M. capillaris lanugine canescens pediculis tenuibus oblongis capitulis in mucrone longo recte sursum exporrectis, R. Syn., 31. F. 31, 4. (R. Syn. iii., 97, 27.)

T. subulata (L.), Hedw., c.fr.—M. capillaris corniculis longissimisis incurvis, R. Syn., 29. F. 31, 7; F. 6, 14. (R. Syn. iii., 92, 3.)

T. unguiculata (Huds.), Roth., c.fr.—M. capillaris assurgens capitulis erectis apicibis fere coccineis, Buddle. F. 31, 9; F. 7, 4.

T. revoluta, Schrad., c. setis.—"M. muralis minimus roseus s. stellaris capitulis longiusculis acutis erectis, Hist. Ox., 628," Bobart MS. F. 31, 17.

Encalypta extinctoria (L.), Sw., c.fr., gymnost.—Adiantum aureum perpusillum fol. congestis acutis pileolo extinctoris forma æmulo, Vernon, R. Syn., 32. F. 30, 11. (R. Syn. iii., 92, 4.)

Cinclidotus fontinaloides (Hedw.), P.B., c.fr.—M. fontalis minor lucens, J. B. ex sententia D. Doody, cui facile assentior, accuratissime enim muscos noscit et distinguit. F. 21, 2. (R. Syn. iii., 72, 2 !)—M. triangulari aquatico similis sed multo minor, Budd. Fontalis minor lucens, J. B. F. 5, 10.

Grimmia apocarpa (L.), Hedw., c.fr.—An M. apocarpus arboribus adnascens minor, Sherrard, R. Hist. vol. iii., 40. F. 29, 11.—M. trichoides capitulis apodibus fol. angustioribus, Doody. F. 29, 16. (R. Syn. iii., 104, 3.)

G. pulvinata (L.), Sm., c.fr.—M. trichoides hirsutie canescens capitulis subrotundis reflexis in perbrevibus pediculis, R. Syn., 34. F. 33, 13; F. 7, 14. (R. Syn. iii., 100, 46.)

Rhacomitrium lanuginosum (Hedw.), Brid., c.fr. — M. alpinus ramosior erectus flagellis brevioribus lanuginosus, Pl. Phyt., 47, 5. F. 20, 9.—M. terrestris vulgari similis lanuginosus, Lhwyd, R. Syn., 37. F. 5, 9. (R. Syn. iii., 97, 28 in part.)

R. canescens (Web.), Brid., *a.*, c.fr.—M. trich. lanuginosus alpinus, Mus. Pet., f. 85. F. 20, 3.—Ster.—M. terrestris lanuginosus, D. Lhwyd, R. Syn., 37. F. 20, 4. (R. Syn. iii., 97, 28 in part.)

R. aciculare (L.), Brid., c.fr.—M. aquaticus pileis acutis, Scampton, Mus. Pet., fig. 4. F. 30, 3.

Zygodon viridissimus (Dicks.), R.Br., c.fr.—M. capillaris parvus cum madefactus stellulæ modo se aperiens, Buddle. F. 31, 13. (R. Syn. iii., 98, 34 !)

Orthotrichum Bruchii (Hornsch.), Spruce, c.fr.—M. capitulis longis acutis pilosissimus, Sherrard, R. Syn., 33. F. 29, 9.—Adiantum aureum minimum pediculis brevibus foliis capillaceis, Mus. Pet., n. 25. F. 6, 4. (R. Syn, iii., 91, 6.)

O. cupulatum, Hoffm., var. *nudum* (Dicks.), c.fr.—Adiantum aureum acaulon pileis striatis, Mus. Pet., f. 24. F. 29, 13.

O. saxatile (Brid.), Wood, c.fr.—M. apodi varietas viz. capitellum brevi pediculo innixum, Doody. F. 29, 14.

O. diaphanum, Schrad., c.fr.—M. capitulo apodi minor hirsutus pileis striatis, Budd. F. 29, 17.—M. acaulos minor hirsutus pileis striatis, Buddle, N.D. F. 6, 10.

O. affine, Schrad., c.fr.—Adiantum aureum acaulon pileis striatis, Mus. Pet.., n. 24. F. 6, 7. (R. Syn. iii., 91, 5.)

Tetraphis pellucida (L.), Hedw., c.fr., et pseudopodiif.—M. capillaris surculis tenuibus capitulis variis aliis viz. tenuissimis in pediculis oblongis aliis autem pulverulentis in surculorum summitatibus nullo fere pediculo, Buddle. F. 32, 3; F. 6, 21. (R. Syn. iii., 78, 4 !) (Conf. etiam F. 32, 5).

Atrichum undulatum (L.), P.B., c.fr.—M. capillaris majusculus

fol. longis cum aliqua latitudine acutis rugosis, R. Syn., 29. F. 30, 4; F. 6, 12. (R. Syn. iii., 95, 15.)

Pogonatum nanum (Neck.), P.B., c.fr.—M. coronatus rigidus minor et humilior capitulis villosis brevioribus, 7 Hist. Ox., 630. F. 29, 5.—Adiantum pileolo villoso minimum, R. Syn., 28. F. 6, 3.

P. aloides (Hedw.), P.B., *a.*, c.fr.—Adiantum pileolo villoso minimum, R. Syn., 28. F. 29, 7. (R. Syn. iii., 91, 3.)—Var. *Dicksoni* (Turn.), c.fr.—Adiantum pileolo villoso minimum pediculo eximie brevissimo, Budd. F. 29, 6.

Polytrichum commune, L., ♂, fr.—Adiantum aureum majus, G., R. Syn., 28. F. 29, 1; F. 6, 1. (R. Syn. iii., 90, 1.)—Forma c. setis.—M. coronatus humilis rigidior capitulis longis acutis sessilibus erectis, Mor. Hist. Ox., pl. 630, 8, tab. 7. F. 29, 10.

P. juniperinum, Willd., c.fr.—Adiantum pileolo villoso medium, R. Syn., 28. F. 29, 2—♂; F. 6, 2. (R. Syn. iii., 90, 2.)

P. piliferum, Schreb., c.fr.—Adiantum medium pilosum capite minore, Doody. F. 29, 3.

Aulacomnion palustre (L.), Schwaegr., c.fr. et pseudopodiif.—M. capillaris palustris flagellis longioribus bifurcatis, Mus. Pet., f. 75.—M. trichoides major palustris citrini coloris, Doody in app. R. Syn. F. 32, 1—♂ et fr; F. 7, 2. (R. Syn. iii., 78, 2.)—Var. *ramosum* (Huds.), ster. et pseudopodiif.—M. trichoides pulverulentis (forsitan variis) capitulis, Vernon. F. 32, 2. (R. Syn. iii., 78, 3 !)

A. androgynum (L.), Schwaegr, c.fr. et pseudopodiif.—M. trichoides alter minor capitulis variis, Budd. F. 32, 4.—Ster et pseudopodiif.*—M. trichoides parvus capitulo conglomerato seu Botryoide, R. Syn., 33. F. 32, 5; F. 6, 9. (R. Syn., iii., 78, 1.)—M. capitulo Botryoide surculis et pediculis longioribus viridissimis, Doody. F. 32, 6.

Bryum roseum (Weiss.), Neck., ♂.—M. stellaris roseus, J. B. R. Hist., p. 113. F. 28, 5; F. 3, 10. (R. Syn. iii, 92, 1.)

B. capillare, L., c.fr.—M. capillaris foliolis latiusculis congestis capitulis oblongis reflexis, Doody, R. Syn., 33. F. 33, 3; F. 7, 11. (R. Syn. iii., 100, 45.) (Conf. etiam F. 33, 5, et F. 7, 10, cespites sinistri)

B. nutans, Schreb., c.fr.—M. trichoides capitulo parvo reflexo pediculo ima mediatate rubro summa luteo-viridi, R. Syn., 34. F. 33, 5; F. 7, 10, cespites dextri. (R. Syn. iii., 100, 44.)

B. bimum, Schreb., c.fr.—M. capillaris major et elatior capitulis longis obtusis deorsum reflexis et veluti pendulis præaltis pediculis rubris, Vernon, R. Syn., 34. F. 33, 2. (R. Syn., iii., 101, 50.)

B. pseudo-triquetrum (Hedw.), Schwaegr., c.fr.—M. capillaris foliolis angustis congestis capitulis reflexis, Buddle. F. 33, 6 (conf. etiam F. 33, 9, cespes sinister).—M. palustris rubens capitulis reflexis in pediculis prælongis a D. Doody ostensum et ita nominatum, N.D. F. 7, 9 (ad sinistrum). *B. alpinum*, Huds., ster. (ad dextrum).

B. argenteum, L., c.fr.—M. argenteus capitulis reflexis, R. Syn., 34. (R. Syn. iii., 100, 47.) F. 33, 7; F. 13, 7.

B. pallens, Sw., c.fr.—M. capillaris palustris rubens capitulis reflexis, Doody. F. 33, 9, cespes dexter. (R. Syn. iii., 102, 55.)

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* Cæspes alius tamen est *Tetraphis pellucida* (L.), Hedw., ster. et pseudopodiif.

B. atropurpureum, W. M., B. S., c.fr.—Musco argenteo persimilis excepto colore, Buddle. F. 33, 11.

B. carneum, L., c.fr.—M. trichoides fontanus minor capitulis turgidulis reflexis carnei coloris, Vernon. M. trich. minor fol. capillaceis viridissimis, R. Syn., 32. F. 33, 12. (R. Syn. iii., 102, 53.)

Mnium cuspidatum, Hedw., ster.—M. polytrichoides aquaticus fol. crebris extremis obtusis et subrotundis, R. Syn., p. 36. F. 17, 3; F. 8. 8. (R. Syn. iii., 103, sub 57.)

M. undulatum (L.), Neck., c.fr.—M. trichoides ramosus fol. long. lucidis et veluti crispis, Doody, R. Syn., p. 36 et p. 32, n. 20 et 21. F. 28, 3; F. 3, 3. (R. Syn. iii., 103, 60.)

M. punctatum (L.), Reich., c.fr.—M. trichoides foliis serpylli rotundis, Doody in app. R. Syn., p. 338. F. 28, 7 et 8; F. 8, 2. (R. Syn. iii., 102, 57.)

M. hornum, L., ♂—M. erectus ramosus oblongifolius, J. Lœselii in Fl. Prussica, 168. F. 28, 13.—c. fr.—M. stellaris sylvarum capitulis magnis nutantibus, Vernon, R. Syn., 35. F. 33, 1; F. 7, 6. (R. Syn. iii., 102, 51.)

M. insigne, Mitt., ster.—"This was sent by Dr. Richardson, by the name of Adiantum ann. humilius fol. oblongis raris pallide viridantibus et vix pellucidis," Bobart MS. F. 34, 2.

Funaria hygrometrica (L.), Sibth., c.fr.—M. capillaris pediculis bulbosis uncialibus pallidis capitula oblonga reflexa sustinentibus, R. Syn., p. 34. M. trich. minoribus fol. ad caulem convolutis capitulis subrotundis reflexis, Doody in app. ed. 1. R. Syn. Adiantum medium palustre fol. bulbi in modum se amplexantibus capitulis erectis, D. Davies, R. Syn., 32. Adiantum aureum minus foliis bulbi in modum dispositis, Vernon, R. Syn., p. 33. F. 33, 10; F. 7, 7. (R. Syn. iii., 101, 49.)

Physcomitrium pyriforme (L.), Brid., c.fr.—M. capillaris parvus capitulis magnis pyriformibus erectis in pediculis brevibus, Doody, R. Syn., p. 29. F. 30, 9; F. 6, 18. (R. Syn. iii., 93, 7.)

Bartramia fontana (L.), Sw., ♂ et c.fr.—M. palustris cinereo viridis scapis longis tenuibus fol. brevissimis, R. Syn., 32. M. stellaris ramosus pal. pediculo aureo erecto capitulo magno sphærico, R. Syn., p. 33. F. 30, 1; F. 7, 3. (R. Syn. iii., 98, 32.)

B. pomiformis (L.), Hedw., var. *β. crispa* (Sw.), c.fr.—M. trichoides medius capitulis sphæricis, Doody, R. Syn., 30. F. 30, 8; F. 6, 13. (R. Syn. iii., 97, 31.)

Splachnum ampullaceum, L., c.fr.—Adiantum aureum minus palustre capitulis erectis coronatus, Sherrard, R. Syn., p. 30. F. 30, 6; F. 7, 8. (R. Syn. iii., p. 93, 6.)

Fissidens adiantoides (L.), Hedw., c.fr.—M. pennatus capitulis adianti, Mor. Hist. 3, tab. 6. F. 28, 9.—M. filicifolius seu pennatus aquaticus maximus, R. Syn., p. 35. F. 28, 11—*F. brevisseta*, c.fr.; F. 8, 4. (R. Syn. iii., 87, 39.)

F. taxifolius (L.), Hedw., c.fr.—M. filicifolius seu pennatus minor pinnulis plurimis ad mediam costam latiusculis crebris, R. Syn., p. 35. F. 28, 10; F. 8, 5. (R. Syn. iii., 88, 41.)

F. incurvus, Stark, theca optime curvata.—M. polytrichoides perexiguus capitulis in summis surculis seu foliis subrotundis erectis, R. Syn., p. 35. F. 28. 12; F. 8. 6. (R. Syn. iii., 88, 42.)

2. *Pleurocarpi.*

Leucodon sciuroides (L.), Schwaegr., ster. et propagulif.—Muscus arboreus clavatus, i.e., summitatibus caulium pulvere seminali repletis, Budd. F. 14, 1.—M. repens serici modo lucens viticulis longioribus erectis, D. Doody in app. R. Syn. F. 1, 1. (R. Syn, iii., 82, 22.)

Antitrichia curtipendula (L.), Brid., ster.—M. domesticus nostras surculis erectis rigidis capitulis in pediculos perbreves, Budd. F. 20, 7 ; F. 3, 6. (R. Syn. iii., 89, 49 !)

Anomodon viticulosus (L.), H. T., c.fr.—M. montanus gracilis ramosus viticulis longioribus glabris, Pl. Phyt., t. 47, f. 4. ; app. R. Syn., 338. F. 20, 6 ; F. 3, 4. (R. Syn. iii., 85, 30.)

A. attenuatus (Schreb.), Hüben., ster.—" M. terrestris virginianus minimus subflavus, Hist. Oxon., 625," Bobart MS. F. 22, 10.

Climacium dendroides (L.), W.M., ster.—M. dendroides elatior ramulis crebris minus surculosis capitulis pediculis brevibus insidentibus, R. Syn., 32. F. 28, 2 ; F. 3, 2. (R. Syn. iii., 81, 9.)

Isothecium Myurum (Poll.), Brid., c.fr.—M. terrestris surculis Kali aut Illecebræ æmulis fol. subrotundis squamatim incumbentibus, R. Syn., 37. F. 23, 6 ; F. 4, 8, (R. Syn. iii., 81, sub 7.)

I. alopecurum (L.), Spruce., c.fr.—M. dendroides sylvarum erectus ramulis Kali æmulis radice repente, R. Syn., 32. F. 28, 1 ; F. 3, 1. (R. Syn, iii., 81, 8.)—Ster.—" M. aquaticus fruticosus fol. parvis pennatis." D. Richardson MS. F. 34, 1.

Leskea sericea (L.), Hedw., c.fr.—M. terrestris luteo-viridis sericeus repens, R. Syn., 38. M. muralis repens sericeus fol. splendentibus, Mus. Pet., n. 83, in app. R. Syn., 324. F. 23, 1 ; F. 4, 10. (R. Syn. iii., 84, 23.)

L. polycarpa, Ehrh., var. β. *paludosa* (Hedw.), B.S., c.setis.—M. aquat. denticulatus minimus, Budd. F. 27, 4.

Hypnum albicans, Neck., c.fr.—M. terrestris parvus albicans erectus foliolis caulibus appressis, Budd. F. 25, 2. (R. Syn. iii., 83, 19 !)

H. Mildei, Schimp., c.fr. (synoicum).—M. terrestris major albicans erectus fol. acutissimis, Budd. F. 25, 3. (R. Syn. iii., 83, 18 !)

H. lutescens, Huds., c.fr.—M. terrestris splendide lutescens surculis et fol. prælongis tenuibus, &c., Budd. F. 23, 2 ; F. 4, 9. (R. Syn. iii., 84, 23 !)

H. rutabulum, L., c.fr.—M. squamosus ramosus minor et crispus Turnef. Inst., 553. F. 25, 1.—M. squamosus ramosus crassior capitulis incurvis, Turnef. Inst., 553. F. 23, 6.—M. terrestris minor omnium vulgatissimus, R. Syn., 36. F. 4, 1., (a. et c.[*]) (R. Syn. iii., 80, 2.)—An M. terrestris repens vulgari similis sed multo minor, R. Syn., 38. F. 4, 2. (R. Syn. iii., 80, 4.)—Fragmentum sterile.—Hic muscus e fonte D. Winifrede a D. Windsor viro potest desumptus et ad me missus surculus hic parvulus madefactus odorem spiravit violaceum. F. 34, 4.

H. velutinum, L., c.fr.—M. terrestris vulgatissimi species minima, Budd. F. 25, 5.—M. terrestris repens parvus capitulis brevibus tumidis nonnihil incurvis et nutantibus, R. Syn., 38. F. 25, 8. (R. Syn. iii., 84, 25.)

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[*] (b.)—*H. brevirostre*, Ehrh., ster.—(d. et e.) *H. velutinum*, L., c.fr.

H. prælongum, L. (= *H. Stokesii*, Turn. !), ster.—M. pennatus minor cauliculis ramosis in summitate velut spicatus, J. Lœselii in Fl. Pruss., p. 167. F. 19, 5.—♂ et c.fr.—M. terrestris parvus supinus Filicis modo interdum pennatus, R. Syn., 38. F. 19, 8; F. 4, 7. (R. Syn. iii., 80, 5.)—Forma elongata, ster.—M. vulgaris flagellis tenuibus fol. minimus, Doody, ed. 1 R. Syn., 244. F. 19, 9. (R. Syn. iii., 80, 5.)

H. piliferum, Schreb., ster.—M. cupressiforme flagellis tenuioribus et foliis acutis, Buddle. F. 24, 2.

H. striatum, Schreb., c.fr.—M. terrestris minor omnium vulgatissimus, R. Syn. F. 25, 4. (R. Syn. iii., 80, 2.)

H. ruscifolium, Neck., ster.—M. pennatus aquaticus, Doody in app. R. Syn., 338. F. 27, 1. (R. Syn. iii., 81, 6.)—c. setis.—M. pennatus aquaticus major, Budd. F. 27, 2.—M. pennatus major aquis fluitans adianti aurei capitulis, D. Sherrard. F. 27, 6.

H. serpens. L., forma ad *H. Juratzkæ* (Schimp.) transiens, c.fr.—M. terrestris omnium minimus capitulis majusculis oblongis erectis, R. Syn., 38. F. 22, 6 et 9; F. 4, 6. (R. Syn. iii., 85, 27.)

H. riparium, L., c.fr.—M. pennatus aquaticus, Budd. F. 27, 5.

H. stellatum, Schreb., c.fr.—An M. palustris valde ramosus surculis erectioribus fol. in tenues et longos mucrones productis, R. Syn., 39. F. 22, 5. (R. Syn. iii., 82, 13.)

H. palustre, Huds., c.fr.—M. aquaticus denticulatus minor, Budd. F. 27, 3.

H. cuspidatum, L., c.fr.—M. palustris surculis quasi pungentibus capitulis ferrum equinum referentibus, Budd. An M. ramosus palustris fol. membranaceis acutis, Vernon, R. Syn., 39. F. 26, 1; F. 5, 6. (R. Syn. iii., 82, 14 !)

H. Schreberi, Willd., ster.—M. erectus fol. angustis caulibus appressis, Doody in app. R. Syn., 337. F. 23, 5; F. 4, 11. (R. Syn. iii., 83, 20.)

H. purum, L., c.fr.—M. terrestris vulgaris cupressi foliis, Mus. Pet., f. 81.—c.fr. (uno cum surculo sterili *H. piliferi*.)—M. trichoides medius ramosus fol. albis mollibus denticulatim dispositis, R. Syn., 39. F. 24, 1; F. 2, 5. (R. Syn. iii., 81, 7.)—Forma *lurida*, ster.—M. cupressiforme viticulis brevioribus et crassioribus fere rotundis et supinis, Buddle. F. 24, 3.

H. tamariscinum, Hedw., c.fr.—M. filicinus, J. B. F. 19, 1; F. 2, 2.

H. abietinum, L., ster.—"M. terrestris surculis filamentosis tenacibus abietinis semel tantum divisis, Hist. Oxon., 626, t. 5," Bobart MS. F. 19, 11.

H. splendens, Sibth., c.fr.—M. terrestris Myricæ fol. ut a D. Vernon nominatum est vulg. in R. Syn. vero omissus. F. 19, 2; F. 2, 3.

H. triquetrum, L., c.fr.—M. terrestris maximus ramosus erectior latioribus fol., R. Syn., 36. F. 20, 2; F. 2, 4. (R. Syn. iii., 80, 1.)

H. loreum, L., c.fr.—M. erectus major fol. angustioribus acutis, Doody in app. R. Syn., 337. F. 20, 5. (R. Syn. iii., 82, 12.)

H. squarrosum, L., c.fr.—M. erectus fol. reflexis, D. Doody in app. R. Syn., 337. F. 22, 2; F. 2, 6. (R. Syn. iii., 82, 10.)

H. Kneiffii (B. & S.), Schimp., forma elongata crassa grandifolia,

ster.—M. fluitans fol. et flagellis longis tenuibusque, Doody in app. R. Syn., 338. F. 26, 2; F. 5, 3. (R. Syn. iii., 82, 13 in part.)

H. filicinum, L., ster. — An M. filicinus minor, C.B. Prod., 151. F. 19, 13.—An M. palustris terrestris similis fol. crassis obscure virentibus mucronibus aduncis unam partem spectantibus, R. Syn., 38. F. 3, 7. (R. Syn. iii., 82, 15 in part.)—c.fr.—An M. palustris valde ramosus surculis erectioribus fol. in tenues et longos mucrones productis, R. Syn., 39. F. 5, 5. (R. Syn. iii., 82, 13 in part.)

H. exannulatum, Gumb., c.fr.—M. palustris scorpioides ramosus erectus, Doody. F. 22, 3.* (R. Syn. iii., 82, 15 !)

H. commutatum, Hedw., ster.—M. cristam Castrensem repraesentans, Budd. F. 19, 6.—Var. β. *falcatum* (Brid.), ster.—An M. palustris terrestris similis fol. crassis obscure virentibus mucronibus aduncis unam partem spectantibus, R. Syn., 38. F. 19, 7. (R. Syn. iii., 82, 15 in part.)

H. uncinatum, Hedw., c.fr.—M. palustris scorpioides ramosus erectus, Doody N.D. F. 5, 8.

H. molluscum, Hedw., c.fr.—M. scorpioides palustris fol. crispis pyramidalibus, D. Davies, R. Syn., 32. F. 19, 3; ster. F. 3, 8. (R. Syn. iii., 86, sub 32.)

H. cupressiforme, L., c.fr.—M. terrestris medius supinus et repens fol. crebris in acutos mucrones productis, R. Syn., 37. F. 24, 4; F. 4, 3; forma major ster. F. 27, 7. (R. Syn. iii., 89, 48.)

H resupinatum, Wils., c.fr.—M. fol. caulibus appressis uno versu dispositis, viticulis minoribus, Doody. F. 24, 5; ster.—F. 4, 4. (R. Syn. iii., 89, 29 !)

H. undulatum, L.—M. terrestris repens Lycopodii ferme facie, Doody in app. R. Syn., 337; c.fr.—F. 21, 4; ster.—F. 5, 1. (R. Syn. iii., 88, 46.)

H. denticulatum, L., c.fr.—M. pennatus sylvaticus, Budd. F. 22, 7. (R. Syn. iii., 88, 44 !)

H. sylvaticum, Huds., c.fr.—M. pennatus sylvaticus, Doody. F. 22, 8; F. 5, 2 et 7.

ON NORTH AMERICAN SPECIES OF CHEILANTHES.

BY D. A. WATT.

WE have in northern North America, occurring within the limits laid down by Dr. Gray in his "Manual," three well-defined species of *Cheilanthes*, with a very confused nomenclature which some of your readers may be able to clear up. For these Prof. Eaton has (in the 5th edition of Gray's "Manual") adopted the following names, and the authors of the "Synopsis Filicum" have followed him.

1. CHEILANTHES VESTITA. — *Polypodium lanosum*, Michx. Herb.! *Nephrodium lanosum*, Michx. Flora ii., p. 279! (1803). *Adianthum hispidum*, Bosc ex Poir. in Lamarck et Swartz? *Acrostichum hispidum*, Bosc ex Sprengel? *Adiantum vestitum*, Sprengel Anleit. iii., p. 122? (1804); English translation, p. 135. *Aspidium lanosum*, Swartz Synopsis Filicum, p. 58 (1806), et *Cheilanthes vestita*, Swartz Syn. Fil., p. 128; Schkuhr. Krypt., t. 124; Gray's Manual ed. 1st, p. 625;

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* See on this specimen a paper by Mr. Carruthers in Journ. Bot., 1863, p. 228.—(*Ed. Journ. Bot.*)

Mettenius Cheilanthes, no. 27; Hooker and Baker Synopsis Filicum, p. 134; &c.

Query.—Can De Bosc's plant be identified with this species, and even if it can, why should not Michaux's name be restored, and the plant named *Cheilanthes lanosa?*

2. CHEILANTHES TOMENTOSA.—*Cheilanthes tomentosa*, Link Hort. Berol. ii., p. 42? (1833). *Cheilanthes Bradburii*, Hook. Sp. Fil. ii., p. 97, t. 109B (1853). *Cheilanthes tomentosa*, Gray's Manual, ed. 2nd (1856), p. 592! and Hook. & Baker Syn. Fil., p. 140!

Exsicc.—Tennessee (Bradley), North Carolina (Rugel, Curtis, Canby), Southern Dacota (Bradbury), and Texas (Drummond no. 354, Lindheimer no. 743).

Writing in 1858, Kunze (in Sill. Journ. vol. vi., p. 87) says that "*Ch. tomentosa*, Link., raised from Mexican spores, now common in European gardens, is new to the Flora of the United States." The same name occurs in Mettenius's catalogue (Fil. Hort. Lips., p. 50), and in his monograph (*Cheilanthes*, no. 45); but his reference to Hooker's plate (loc. cit., t. 109A, which is *Ch. Eatoni*, Baker) makes it doubtful what species is intended. In Mr. J. Smith's "Catalogue of Ferns in the Royal Gardens, Kew," occurs the name "*Notholæna tomentosa*, Desv., Mexico"; in his "Cultivated Ferns" (1857), and in his "Ferns: British and Foreign" (1866), "*Myriopteris tomentosa*, Fée, = *Ch. tomentosa*, Link., Hook. Sp. Fil., t. 109A," is given as a species "cultivated in British gardens," but his references are equally confusing, and, moreover, no plant referable to either species is given in Mr. Baker's catalogue of the Kew collection.

Query.—Is the plant of the Berlin and Leipzig gardens this species, and what is the authority for its Mexican habitat? Fée's reference to Drummond's Texas plant is a manifest error.

3. CHEILANTHES LANUGINOSA.—*Cheilanthes vestita*, Hook. Fl. Bor. Am. ii., p. 264 (1840); Sp. Fil. ii., p. 98, t. 108B (non Swartz). *Myriopteris gracilis*, Fée Gen. Fil., p. 150, t. 29, fig. 6 (1850-52). *Cheilanthes gracilis*, Metten. Cheil., p. 36 (1859). *Cheilanthes lanuginosa*, "Nuttall," Gray's Manual, ed. 4th, p. ci. in addenda (1864).

Exsicc.—Wisconsin (Hale), Iowa (Vasey), Illinois (Lapham), and Missouri (Englemann); west to the Rocky Mountains (Bourgeau, no. 3689, N. lat. 51°) and California (Whipple's Expedition); and south to Kansas (E. Hale), New Mexico and Texas (Ch. Wright, nos. 818 and 2125).

Query.—If Hooker's name be inadmissible, what possible reason can there be for preferring Nuttall's herbarium name to Fée's earlier one? The latter's description and figure are excellent, and have priority over even Hooker's notice of Nutttall's plant in "Species Filicum."

"*Cheilanthes vestita*, Riehl non Sw., no. 529," fide Fée loc. cit. What is the locality and species of Riehl's plant? His publication is unknown here.

I enclose specimens of each of the plants [*i.e.*, to Mr. Baker], that there may be no doubt as to the species we call by these names.

ADDITIONAL SPECIES AND NEW LOCALITIES FOR THE FLORA OF TUSCANY.

By J. F. Duthie.

Having spent a few months last summer at the Baths of Lucca, I am able to record a few additional species for the flora of Tuscany, also several important localities besides those mentioned by Prof. Caruel in his "Prodromo della Flora Toscana," published in 1860, and its two supplements of 1865 and 1870. In a later work—"Statistica Botanica della Toscana"*—Prof. Caruel recognises in Tuscany five botanical regions, viz., (1) maremmana, (2) campestre, (3) submontana, (4) montana, (5) alpestre; which correspond in a general way to (1) the coast-line, (2) from thence to the bases of the mountains, (3) the Chestnut region from the bases of the mountains to the lower limits of the Beech, (4) the region of the Beech, the last tree to be met with on ascending the Tuscan Apennines, (5) the bare summits. In the following list of plants for which I have found new localities, I will mention in every case where the new locality admits the plant into a fresh botanical region.

Thalictrum flavum, L. Turrite Cava, Alpe Apuane.

Draba muralis, L. Rocks near Ponte Nero, Val di Lima.

Iberis umbellata, L. Near Gallicano, Alpe Apuane.

Erucastrum Zanonii, Ball. Monte di Vico, above the Val di Lima.

Lepidium graminifolium, L. La Villa, Bagni di Lucca.

Reseda luteola, L. Roadside near Ponte Nero, Val de Lima.

Helianthemum polifolium, Bert. Pratoflorito.

H. Fumana, Mill. Rocks above Ponte Nero, Val di Lima.

Dianthus liburnicus, Bartl. Near Gallicano, Alpe Apuane; not uncommon at La Villa, Bagni di Lucca. Ascends to base of "submontane" region.

Dianthus velutinus, Guss. Val di Lima, Bagni di Lucca.

Silene Armeria, L. Damp rocks near Ponte Nero, Val di Lima.

Stellaria uliginosa, Murr. Wet places in the woods, La Villa, Bagni di Lucca.

Elatine triandra, Schk. This interesting addition to the Flora of Tuscany M. Sommier and I discovered on the outskirts of Lago Nero, a mountain tarn situated about 5000 feet above the sea, on the Apennini Lucchese. Some nearly dried-up hollows on the edge of the tarn were covered with this plant, the delicate green colour of which showed conspicuously at a distance. This is the second species of the genus recorded for Tuscany, *E. Alsinastrum* having been found in May, 1870, by Mr. Groves near Pisa. The other known localities in Italy for *E. triandra* are in Lombardy, in the neighbourhood of Milan and Vercelli. The Tuscan locality is in the "alpestre" region.

Herniaria hirsuta, L. Bagni di Lucca.

Linum angustifolium, Huds. Old alluvial ground near Le Fabbriche, Bagni di Lucca.

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* Reviewed in this Journal, 1872, p. 116.

Althæa hirsuta, L. Val di Lima, on the hill opposite to Le Fabbriche, Bagni di Lucca.

Ruta bracteosa, DC. Old wall at Coreglia in the Garfagnana; ascends to "submontane" region.

R. angustifolia, Pers. Rough hill near Borgo a Mozzano, Val di Serchio.

Rhamnus alpina, L. Rocks above Ponte Nero, Val di Lima; descends to "submontane" region.

Lotus angustissimus, L. Near La Villa, Bagni di Lucca; ascends to base of "submontane" region.

L. hispidus, L. Near La Villa, Bagni di Lucca; ascends to base of "submontane" region.

Astragalus purpureus, Lam. Old alluvial ground near Le Fabbriche, Bagni di Lucca.

A. depressus, L. Pratofiorito. This locality has been mentioned by Giannini.*

Ervum gracile, DC. By the Lima, Bagni di Lucca; ascends to base of "submontane" region.

Vicia bithynica, L., var. *angustifolia*. High heathy ground opposite Le Fabbriche, Bagni di Lucca; ascends to "submontane" region.

Potentilla recta, L., var. *obscura*, Willd. Near La Villa, Bagni di Lucca. Caruel does not mention this variety.

P. argentea, L. Rocks in the Val di Lima near Ponte Nero.

Epilobium rosmarinifolium, Hænck. Below Palleggio, Val di Lima.

E. alsinifolium, Vill. Near the Spedaletto, Apennini Lucchese.

Œnothera biennis, L. Old alluvial ground near Le Fabbriche, Bagni di Lucca.

Callitriche stagnalis, Scop. Wet places under Chestnuts, near Le Fabbriche, Bagni di Lucca; ascends to base of "submontane" region.

C. verna, L.? Lago Nero, Apennini Lucchese; "alpestre" region.

Lythrum Hyssopifolia, L. Near La Villa, Bagni di Lucca; ascends to base of "submontane" region.

L. Salicaria, L. Val di Lima, Bagni di Lucca.

Portulaca oleracea, L. Val di Lima, Bagni di Lucca.

Hydrocotyle vulgaris, L. Ascends to base of "submontane" region near La Villa, Bagni di Lucca.

Pimpinella peregrina, L. Ascends to base of "submontane" region near the Bagni di Lucca.

Trochiscanthes nodiflorus, Koch. Forno Valley above Gallicano, and Turrite Cava; both localities at the base of the Apuan Alps.

Selinum sulcatum, Bert. Mte. di Vico, above the Val di Lima.

Physospermum aquilegifolium, Koch. Near Gallicano, Alpe Apuane.

Cornus Mas, L. Above Ponte Nero, Val di Lima.

Lonicera etrusca, Sant. Turrite Cava, Alpe Apuane.

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* The late Dr. Giovanni Giannini lived at Tereglio, a picturesque village built on a high ridge connected with Monte Rondinaio, one of the highest of the Tuscan Apennines. He was an enthusiastic botanist, and thoroughly explored all the mountains in the vicinity. His catalogue of Apennine plants was published in a work on the Baths of Lucca by Dr. Carina.

Asperula taurina, L. Near Ponte Nero, Val di Lima.

Galium sylvaticum, L. Shady side of the Turrite Cava, Alpe Apuane, and below Lucchio, in the Val di Lima; descends to "submontane" region.

G. sylvestre, Poll. Rocks above Ponte Nero, Val di Lima; "submontane" region.

Scabiosa succisa, L. Turrite Cava, Alpe Apuane.

Erigeron canadensis, L. Ascends to "submontane" region in the Val di Lima.

Inula salicina, L. Turrite Cava, Alpe Apuane.

I. viscosa, Ait. Ascends to "submontane" region at Tereglio.

Asteriscus spinosus, Gren. & Godr. Ascends to "submontane" region near Ponte Nero, Val di Lima.

Anthemis Triumfetti, All. Sides of torrents, Bagni di Lucca.

Santolina Chamæ cyparissus, L. Old alluvial ground by the Lima, near Le Fabbriche, Bagni di Lucca.

Echinops sphærocephalus, L. La Villa, Bagni di Lucca.

Cirsium pannonicum, Gaud. High rough pasturage above Forno, on the Pietro Pania, Alpe Apuane. New to the flora of Tuscany; "montane" region.

Tolpis umbellata, Bert., and *T. virgata*, Bert. Both ascend to base of "submontane" region near La Villa, Bagni di Lucca.

Hypochæris glabra, L. Near La Villa, Bagni di Lucca; ascends to base of "submontane" region.

Seriola ætnensis, L. Ascends to base of "submontane" region near La Villa, Bagni di Lucca.

Robertia taraxacoides, DC. "Balzo del Valloncello," Apennini Lucchese.

Zacintha verrucosa, Gærtn. Hillside opposite to Le Fabbriche, Bagni di Lucca; ascends to base of "submontane" region.

Crepis neglecta, L. Ascends to base of "submontane" region near Le Fabbriche, Bagni di Lucca.

Hieracium prenanthoides, Vill. Several plants on the wall of the mill-stream near the Ponte á Diana, Val di Lima, Bagni di Lucca. There is only one other locality recorded for this plant in Tuscany, namely, "Boscolungo, on the Apennini Pistoiese."

Hypopitys multiflora, Scop. Near Lugliano, Bagni di Lucca.

Menyanthes trifoliata, L. Lago Nero, Apennini Lucchese.

Primula Auricula, L. Mte. di Vico, above the Val di Lima.

Heliotropium europæum, L. Cultivated ground near Lugliano, Bagni di Lucca.

Symphytum tuberosum, L. Near La Villa, Bagni di Lucca.

Lithospermum graminifolium, Viv. Pratofiorito, rocks near the summit.

L. purpureo-cæruleum, L. Near Ponte Nero, Val di Lima.

Echinospermum Lappula, Lehm. By the Ponte Scesta, Val di Lima.

Omphalodes verna, Mœnch. Plentiful on the shady side of Turrite Cava, Alpe Apuane.

Physalis Alkekengi, L. Bagni di Lucca.

Verbascum floccosum, W. & K. By the Lima near Le Fabbriche, Bagni di Lucca.

Euphragia viscosa, Benth. Ascends to base of "submontane" region near Ponte Nero, Val di Lima.

Euphrasia minima, Schleich. Plentiful on the high ridge above Boscolungo, Apennini Lucchese; growing with another small form (or subspecies?) of *E. officinalis* with large lilac-coloured flowers.

Calamintha grandiflora, Mœnch. Descends to base of "submontane" region at the Bagni di Lucca.

Melissa officinalis, L. Ascends to base of "montane" region at the Ponte á Gaglio, Apennini Lucchese.

Globularia incanescens, Viv. Pratofiorito, rocks near the summit.

Plantago Cynops, L. Bed of the Serchio, near Ghivizzano.

Amaranthus sylvestris, Desf. La Villa, Bagni di Lucca.

Polygonum dumetorum, L. La Villa, Bagni di Lucca.

Asarum europæum, L. Forno Valley above Gallicano, Alpe Apuane; Val di Lima, near the Ponte á Diana, Bagni di Lucca.

Limodorum abortivum, Swartz. Above La Villa, Bagni di Lucca.

Cephalanthera ensifolia, Rich. Rocks above Ponte Nero, Val di Lima.

Epipactis microphylla, Swartz. Damp wood near La Villa, Bagni di Lucca.

Serapias Lingua, L. Above La Villa, Bagni di Lucca.

S. cordigera, L. Fir wood above La Villa, Bagni di Lucca.

S. neglecta, De Not. Above La Villa, Bagni di Lucca; ascends to "submontane" region.

Aceras anthropophora, R.Br. Bushy places above Ponte Nero, Val di Lima.

Ophrys apifera, Huds. Above La Villa, Bagni di Lucca.

O. arachnites, Host. Bushy places above Ponte Nero, Val di Lima.

Allium ochroleucum, W. & K. Monte di Vico, above the Val di Lima.

Ornithogalum pyrenaicum, L. La Villa, Bagni di Lucca.

Juncus filiformis, L. Lago Nero, Apennini Lucchese.

Lemna minor, L. Ascends to base of "submontane" region near Le Fabbriche, Bagni di Lucca.

Cyperus flavescens, L. Wet sandy ground by the Lima, near Le Fabbriche, Bagni di Lucca.

Eleocharis palustris, R.Br. By the Lima near La Villa, Bagni di Lucca.

Carex echinata, Murr., var. *grypos*, Schk. Wet places on the Pizzorna Mountain; not mentioned by Caruel in his Flora of Tuscany.

Deschampsia cæspitosa, Pal. On the Pizzorna.

Kœleria phleoides, Pers. Ascends to base of "submontane" region near La Villa, Bagni di Lucca.

Eragrostis poæoides, Palis. de Beauv. Bed of the Serchio near Ghivizzano, in the Garfagnana. Not mentioned by Caruel in his Flora of Tuscany.

E. pilosa, Palis. de Beauv. Ascends to base of "submontane" region near Ponte Nero, Val di Lima.

Festuca gigantea, Vill. Below Lucchio, Val di Lima; "submontane" region.

Asplenium septentrionale, Hull. By the Lima near La Villa; descends to base of "submontane" region.

Nephrodium Thelypteris, Desv. Val di Lima, near the Bagni di Lucca.

Osmunda regalis, L. Above La Villa, Bagni di Lucca.

NOVAM PLECTRANTHI SPECIEM

PROFERT H. F. HANCE, PH.D.

Plectranthus (*Coleoides*) *marmoritis*,* sp. nov.—caule glanduloso-tomentello erecto subsimplici 1-2 pedali folioso, foliis deltoideo-ovatis præter basin integerrimam grosse serratis acutis supra sparsim pilosulis subtus pallentibus nervisque parum prominulis strigosis 2-3 pollicaribus basi in petiolum lamina subbreviorem cuneato-attenuatis, racemis simplicibus, bracteis minutis ovatis, verticillastris remotis 4-6-floris, pedicellis calyces æquantibus, calycibus fructiferis nutantibus campanulato-tubulosis prominenter venosis glanduloso-pilosis 3-4 linealibus labiis subæquilongis superiore late ovato acuto inferiore setaceo 4-dentato dentibus 2 infimis mediis duplo fere brevioribus, corollæ roseæ calyce triplo longioris tubo exserto defracto labio inferiore concavo porrecto, staminibus modice exsertis stylo brevioribus.

Ad rupes marmoreas Tsat sing ngam, seu "cautes septem stellarum," secus fluvium West River, prov. Cantonensis, d. 18 Julii 1872, legg. Sampson et Hance. (Exsicc. n. 17725.)

Proxime, ni fallor, affinis *P. Gardneri*, Thw., e Zeylania, qui vero habitu humiliore, foliis multo minoribus, corollæ tubo breviore, recto, cet., statim dignoscendus. Præter hanc speciem, *P. ternifolius*, Don., et *P. amethystoides*, Benth., in ditione Cantonensi occurrunt.

DESCRIPTION OF UTRICULARIA NIVEA, *Vahl.*

BY S. KURZ.

HAVING had the opportunity of seeing *U. nivea*, Vahl., growing in the plains of Northern Bengal, I will give here a short description, made chiefly on the spot. The very small white flowers, and especially the minute 2-lobed upper-lip, easily distinguish the species from *U. racemosa*, Wall.

Utricularia nivea, Vahl. Enum. Pl. i., 203; DC. Prod. viii., 21; Wall. in Roxb. Fl. Ind. ed. Wall. i., 144; Oliv. in Journ. Linn. Soc. iii., 186.—(*U. albiflora*, Griff., Not. Dicot., 168, non R.Br.; *U. filicaulis*, Wall. List, 1501; Oliv. l. c., 186.)—An erect, simple, glabrous

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* "Herbam . . . . in marmoribus . . . . nascentem. Qua de causa et marmoritin vocari."—Plin. Nat. Hist. xxiv., 102.

annual, 1 to 4 in. high while in flower, leafless or rarely furnished at base with obovate-linear, shortly-petioled leaves; flowers shortly racemose, very small, on a very short petiole hidden within 3 bracteoles, the fourth bracteole bent downwards and partially adnate to the naked scape; sepals a line long, concave-orbicular, the upper erect, the lower bent downwards; corolla about 2 lin. long, the upper lip minute, notched, the lower lip concave, rotundate, indistinctly 3-lobed, uniformly white or yellow on the palate; spur twice as long as the lower lip, conically-saccate, blunt; capsule globular, nearly a line in diameter, crowned by the capitate short style, chartaceous, 2-valved, about as long as the concave-orbicular, thick, membranaceous sepals; seeds very minute, pale-brown.—The species grows chiefly on short-grassed pastures (where also chiefly Cyperaceæ grow) and in shallow water on sandy soil, all over Bengal; also in Tenasserim. Fl. June—Sept.

As in the case with *U. racemosa*, so I find here only a very few seeds in each capsule, and sometimes none at all.

The classification of Utricularias as adopted by De Candolle and Oliver appears to me to be not quite in accordance with nature. I subjoin here my own views with regard to Indian species. It is probable that the subgenus ii., *Oligocista*, as defined here, may have to be merged as a simple section into the first subgenus, *Lentibularia*.

SUBGENUS I.—*Lentibularia*, Gesn. Submerged-floating branched herbs. Leaves variously cut into capilliform segments, rarely simple and filiform. Capsule free, supported (but not enclosed) by the enlarged, fleshy, membranaceous, not winged sepals.—Examples: *U. stellaris*, *flexuosa*, &c., with yellow, *U. punctata* with blue (not yellow) flowers.

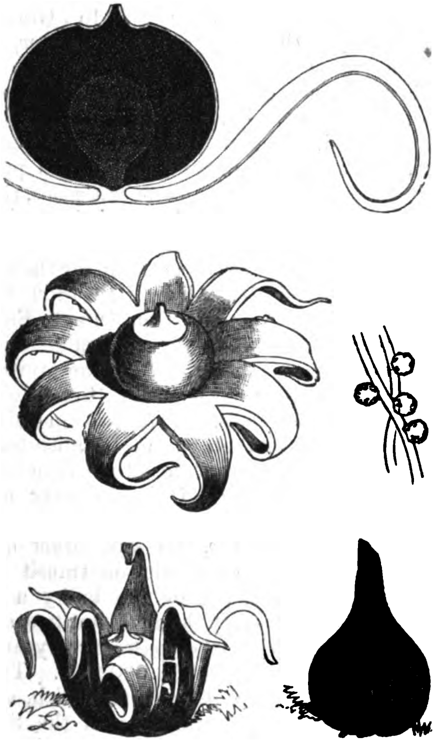
SUBGENUS II.—*Oligocista*, DC. p.p. Erect terrestrial annuals. Leaves radical, narrow, disappearing before flowering-time. Capsule free, not enclosed in the concave, thick, membranaceous, enlarged, not winged, almost equally long sepals. Style and stigma persistent. Bracteoles 4, 3 of them erect, the fourth bent downwards and adnate to the scape.—Examples: *U. racemosa* and *U. nivea*.

SUBGENUS III.—*Bivalvaria*. Erect terrestrial annuals. Leaves radical, entire, narrow, usually disappearing before flowering-time. Capsule free, enclosed in a central cavity of the 2 nearly equal, valvately-complanate, chartaceous, spuriously-winged sepals.—Examples: *U. Griffithii* (of which *U. lilacina*, Griff., is a synonym), *U. bifida*, &c. (§ ii.A of Oliver).

SUBGENUS IV.—*Phyllaria*. Erect terrestrial, often rock-loving, tender annuals, sending out short stolons. Leaves often broad and petioled, radical or on the stolons, persistent during flowering-time. Capsule halfways adnate to the upper enlarged, chartaceous, winged, and often net-veined sepal, the lower sepal minute, bent downwards. Lower lip of corolla large and explanate. Probably a distinct genus. —Examples: *U. orbiculata*, *furcellata*, &c.

SHORT NOTES AND QUERIES.

Geaster saccatus, *Fr.*—Mr. W. G. Smith gives a figure—here, by the kindness of the Editor of the "Gardener's Chronicle," reproduced—and description of this new British species in that periodical for 20th September last. The specimens were found in the grounds of P. P. Smith, Esq., Truro, Cornwall, by Mr. J. Mitchell. The following is Fries' description (Syst. Mycolog. iii., p. 16):—"Outer peridium saccate, cleft into many flaccid subinvolute laciniæ; interior peridium sessile, crowned with a circular flat disc and a sharp silky mouth." To this Mr. W. G. Smith adds the following particulars from the English specimens:—"The outer peridium opens out into a seven-, eight-, or nine- rayed star, the rays (as says Fries) being 'narrowed from a wider base into a very long point,' and furnished on the outside with a membranous evanescent bark, yellow-brown in colour. These rays are at length 'longitudinally subinvolute, twisted at the point,' and bagged towards the centre. The interior peridium is seated in this saccate depression, and is felted with closely adpressed tomentum,



densely so on the circular disc round the fimbriated mouth. The colour of the interior layer of the external peridium and the inner peridium is a beautiful pale soft dove colour with an inclination to pale buff. The spores are dark brown, slightly echinulate, and measure ·00013″ diam." The figures are half natural size, the section natural size, the spores enlarged 700 diameters.

Esparto Grass.—Fibrous substances, whether for textile purposes or for paper-making, have occupied much attention of late. The fact that paper can be made from almost anything has not lessened the demand for the old staple article, rags, and next to rags perhaps Esparto or Sparto Grass. But there seems to be a fear lest the supply of the latter should fail, or at least diminish, for Consul Playfair, the British representative at Algiers, tells us in a recent report that "Alfa or Alpha fibre, or Sparto Grass, which covers immense spaces on the high plateau, is cut down and renews itself annually without any culture. A very reckless system, however, is pursued, and unless proper steps are taken to restrain the collection of it to proper seasons, there is a chance of its becoming as rare in Algeria as it now is in Spain." A tract of country rich in Alfa that has hitherto been neglected owing to the difficulty of transit will ere long be opened out by the construction of a railway between Ilelet and Bel Abbes. In 1862 the first cargo, consisting of only 154 tons, was taken from Oran to England; in 1872 about 60,000 tons were exported, amounting in value to about 7,200,000 francs. This, however, was a falling off from the previous year, which is considered to be chiefly due to two causes—first, the overstocking of the English market; and secondly, that a great quantity of worthless fibre has been sent into the market, causing English buyers to become suspicious of the Algerian produce, the Spanish-grown grass being considerably more in favour. Quite recently a large trade in Esparto has sprung up with Mogadore, about 2000 tons having been shipped during the past year, and still larger quantities would be brought were it not for the difficulty of transit between Mogadore and England, Esparto being of too bulky a nature for the regular line of steamers to carry large quantities as part of their cargoes. From Tunis during the past two years the average exports to England have been about 13,000 tons. The demand from this source has likewise of late fallen off, which, as in the other cases, is attributable to the better quality of the Spanish product. When these facts and figures are considered it is not a little remarkable that we should have been until recently comparatively in the dark concerning the correct botanical origin of this valuable paper material. Alfa and Esparto have hitherto been considered as the produce of distinct plants, some persons referring the former to *Lygeum Spartum*, L., and the latter to *Macrochloa tenacissima*, Kth., while others have simply reversed it. The grass as known in commerce consists only of the leaves merely torn from the plant, and from the specimens that I have seen from time to time, including those contained in the Kew Museum, always appeared to me identical, though from want of flowers or other material to determine them no satisfactory conclusion could be arrived at. Anxious to settle the question, I wrote some time since to Mr. F. G. Lloyd, the well-known importer of Esparto Grass, who owns large tracts of land both in Algeria and Spain, and he kindly replies as follows:—"There is no difference between Esparto and Alfa. Alfa, or more correctly Halfa, is the Arabic for Esparto, hence the Esparto from Africa got that name. Algerian Esparto is of less commercial value than Spanish on account of its containing more silica and iron, and the Esparto of Tunis and Tripoli contains still more than Algerian. The plant called Alfa in Egypt is not Esparto at all, but Diss (*Ampelodesmos tenax*, Link)." This, then, confirms my previous opinion, that Alfa and Esparto were botanically identical, and were only commercial distinctions, and that both were furnished by *Macrochloa tenacissima*, Kth., which is undoubtedly the case from flowering specimens that have been received at Kew. This excludes *Lygeum Spartum* from any participation in the matter at all. But there is yet another paper-making grass, known in the trade as Albardine, which comes, I believe, chiefly from the neighbourhood of Barcelona; from a flowering specimen and also from a photograph of a plant in flower kindly sent me by Mr. Lloyd, there remains no doubt but that Albardine is furnished by *Lygeum Spartum*. Its commercial value is not more than a quarter that of Esparto.—JOHN R. JACKSON.

PLANTS OF COUNTY CORK.—*Euphorbia amygdaloides*, Linn. This species has been hitherto known to grow only in a single locality in the entire extent of Ireland, viz., under trees in Castle-Bernard Park, near Bandon, in this county. It was, therefore, very interesting for me to find it growing freely in a wood at Dunderrow, on the banks of the Bandon river, but eight or nine miles lower down. It also grows in a little copse still farther down the river, and about three miles from Kinsale, called Roughwood, or Bullen's Wood. Rather singular to find this, a common English plant, apparently confined in Ireland to the valley of the Bandon river.—A new station for another interesting species is Peafield, near Ballinadee, for *Asplenium acutum*, Bory.—Again in the wood at Dunderrow where *E. amygdaloides* grows, I found a grass rare in this county, *Milium effusum*.—I may add to these desultory notes that I noticed the beautiful *Linaria repens* growing here and there on the banks of the Bandon river at points below Innoshannon, and indeed halfway or more between that village and Kinsall. Also very freely on slate refuse bordering the Ballinadee Creek.—A new station for another interesting species is one at Blind Harbour, near Glandore, in the extreme west of this county, for the rare (with us) little Snapdragon, *A. Orontium*. There, close to the water's edge, I found it growing in a potato-field, in a wild sequestered spot. I was glad to perceive that Mr. Longfield sent you a note of his discovery of *Lycopodium inundatum* in this county (another instance of a common English plant being extremely rare in Ireland). With the *Lycopodium* grows the rare *Cicendia filiformis*. This was also found by Mr. Longfield far to the east of any station yet known in this county.—T. ALLIN.

LEUCANTHEMUM VULGARE, var. β. *mucosum*, Gay Monogr. inedit.—L. acheniis disci mucosis, radii non aut vix, cæteris ut var. *a*. Chrysanthemum leucanthemum β. corymbiferum Gay in Mutel Fl. Fr. ii. (1835), p. 154.—Habitat in Neustriæ inferioris maritimis ad vicum Pirou inque adversis Cæsarea et Sarnia insulis (Gay! ann. 1831 et 1832), quibus locis alia nulla occurrebat *Leucanthemi vulg.* forma.—Die 5^a Julii florebat in agro Pirouano.—In hortum delata eadem Parisiis, ann. 1833, initium florendi faciebat die Maii 26^a. Herba unibipedalis, glaberrima. Caules simplicissimi inferne, superne in ramos 3-6 longos et fastigiatos divisi, quam ob causam planta capitulorum pulchre radiantium copia, sive sylvestris sive culta, valde est insignis. Folia fasciculorum 1-2 unc. longa, spathulata inciso-5-lobata, lobis crenatis, caulina spathulato-linearia, inciso pinnatifida. Involucri squamæ, ut *L. vulgaris* fusco-marginatæ, variant pallidæ ex toto (specimen e Pirou). Radius tantum longus quantum diametrum disci est latum. Achænia 1½-2 millim. longa, disci calva omnia, aqua etiam frigida immersa mucosa et manifesto et copioso obvelata, radii achænia non aut vix mucosa, sæpius calva, variant auricula dimidiata brevissima, indivisa vel 2-3 dentata coronata.—Habitu ramoso et consequente capitulorum copia, foliisque omnibus, etiam radiantibus, inciso- vel pinnatifido- lobatis, planta est notabilis, eo magis quod locis indicatis sola occurrit, quodque seminibus in horto propagata minime redit ad formam vulgarem, sed et vegetior et ramosior evadit. Ejusmodi notæ parvi tamen sunt faciendæ, quæ scilicet apud *L. pratense*, quamvis rarius, occurrunt. Majore attentione digna ea videtur achæniorum proprietas, quam titulum plantæ posuimus quamque, inter tot *Leucanthemi vulgaris* formas, ei soli plantæ propriam novimus. Sed et hæc quoque nota infirma habenda, ubi notis nullis aliis æquipollentibus sustentata venit. Eo solum inservire debet, ut moneat vim ei nullam inesse essentialem, et igitur neque in iis plantis esse nimium premendam in quibus majoris dignitatis speciem præ se ferre poterit videri.—(*Extracted from J. Gay's MSS. in his Herbarium now at Kew.*)

Notices of Books.

Prodromus systematis naturalis regni vegetabilis, sive Enumeratio Contracta ordinum, generum, specierumque plantarum huc usque cognitarum, juxta methodi naturalis normas digesta: editore et pro parte auctore ALPHONSO DE CANDOLLE. Pars decima septima, sistens ultimos Dicotyledonearum ordines, historiam, conclusionem atque indicem totius operis.—Parisiis: sumpt. G. Masson, 16 Oct., 1873. (pp. 495).

THIS long-expected and very welcome volume closes a series of twenty, and completes—with the exception of the *Artocarpaceæ*—the Dicotyledons. The work was commenced in 1824 by A. P. De Candolle, on the relinquishment of his much more extended "Systema

Naturale," only two volumes of which were published, and since his death in 1841 has been steadily carried on under the editorship of his son, Alph. De Candolle, who has now brought it to a conclusion, fifty years after its commencement. It is scarcely necessary to say that the "Prodromus" consists of a series of condensed monographs of the natural orders written by leading botanists on a common plan of treatment, and each intended to embody all the material available at the period, and be a complete descriptive enumeration of all known species. The immense utility of the work has been shown by experience, and it can only be a matter of deep regret that the experienced and thoroughly competent botanist who has successfully carried through the press thirteen volumes, extending over thirty-two years, does not feel himself any longer equal to the labour and difficulties of the task, but leaves the great work after all unfinished, with even the Dicotyledons incomplete by the omission of a large and intricate family. The prospect of the Monocotyledonous Orders is no doubt a very formidable one, especially the Glumiferæ; and as M. De Candolle points out in his "Réflexions sur les ouvrages généraux de Botanique descriptive," in the "Archives de la Bibliothèque Universelle" of Geneva for November last, the difficulties are rapidly increasing, not only from the immense additions to herbaria, books, and periodicals, but from the advance of the science of botany itself, which will demand in future monographs a far more complete treatment of plants, including their minute anatomy and the history of development of different organs, and more philosophical modes of grouping, than have been hitherto required in such treatises. He hopes to see such really exhaustive monographs undertaken, but experience has shown him that this cannot in the future be done under the auspices of a single individual.

The orders in this concluding volume are the *Ulmaceæ*, by Planchon, with 11 genera and 137 species; the *Moraceæ*, with 25 genera and 91 species, and a sketch of the genera of the *Artocarpaceæ* by Bureau (29 genera); the *Lennoaceæ*, a small order of parasitic rarities of doubtful affinity, consisting of *Pholisma*, *Lennoa*, and *Ammobroma*, by Count Solms-Laubach; the *Podostemaceæ*, by Weddell (105 species in 25 genera); the *Cytinaceæ* (including *Rafflesiaceæ*), by Dr. Hooker (7 genera, 23 species); and the *Balanophoraceæ*, by Eichler (38 species in 14 genera). Besides these are several small groups omitted in their proper places in former volumes and now supplied: *Sarraceniaceæ*, by Alph. De Candolle (3 gen., 8 sp.); *Phytocreneæ* (a tribe of *Olacineæ*), by Baillon (8 gen., 33 sp.); *Salvadoraceæ*, by Alph. DC. (4 gen., 7 sp.); *Cynocrambe*, referred to *Salsolaceæ*, and *Batis*, with an order to itself, by the same; and *Nepenthaceæ*, (34 sp.), by Dr. Hooker.

We have also a list in alphabetical order of the genera which though published were from various causes omitted in the successive volumes of the "Prodromus." Of these many have since been referred to their places, usually as synonyms, by subsequent authors; but not a few, chiefly of Aublet and Loureiro, remain still undetermined, the scanty descriptions given by their authors being insufficient to identify them; some, however, have been determined from their specimens in the British Museum. A very full Index to the Genera, &c., of the whole series of volumes concludes the work.

The few pages of concluding words by M. De Candolle will be read with interest by all botanists. The author gives in them a brief history of the progress of the book, and some curious statistics. The "Prodromus" contains 214 natural orders, 5134 genera, and 58,975 species; had the *Artocarpaceæ* been monographed the number of Dicotyledons would have been about 60,000. *Compositæ* are of course the largest order, with 911 genera and 8561 species, and are followed by *Leguminosæ*, with 283 genera and 3853 species. The largest genus is *Solanum* with 915 species (probably unduly multiplied), the next *Euphorbia* and *Senecio*, with 751 and 601 respectively. So many as 657 new genera and 11,790 new species have been described in the work, a proportion to the old of 15 and 25 per cent. respectively. The whole book contains 13,194½ pages; and nearly half—*i.e.*, no less than 5950 pages—have been contributed by the three generations (father, son, and grandson) who bear the honoured name of De Candolle. Of the other authors, it is somewhat remarkable to notice, considering that systematic botany is followed in England to the exclusion almost of other branches, that no more than three—Bentham, J. D. Hooker, and Weddell—are our countrymen; whilst there are 11 Swiss, 9 French, and 8 German authors, and the remainder consist of an Italian, a Swede, a Dutchman, and a Belgian. H. T.

Where there's a Will there's a Way! or, Science in the Cottage. An Account of the Labours of Naturalists in Humble Life. By JAMES CASH. London: Hardwicke. 1873. (Pp. 224.)

IN this little book are brought together some interesting particulars concerning those working men, of the Manchester district especially, who have earned for themselves a right to a niche in the gallery of naturalists by their persevering study of nature in spite of serious obstacles. Some such record was due to men who, by their example, did so much to kindle that spirit of observation which, especially in the North of England, has led to the establishment of the numerous field clubs and natural history societies, which in many instances number their members by hundreds. It is indeed only to be wished that in these societies there was more of the earnestness which characterised these pioneers of the movement; we should then have more to record of their proceedings than is at present the case.

Several of the names in Mr. Cash's volume will be familiar to our English readers, who will be glad to know more of the inner life of men whose contributions to science have frequently come under their notice. Such are Samuel Gibson, of Hebden Bridge, who was a frequent contributor to the old series of the "Phytologist"; Richard Buxton, author of "Flora of Manchester"; Edward Hobson, an accurate muscologist, and author of "Musci Britannici"; and others. A more widely-known member of the same body was George Caley, a Lancashire weaver, who was despatched to New South Wales by Sir Joseph Banks, where he made extensive collections of plants, many of which were described by Robert Brown, who termed him "botanicus peritus et accuratus," and named after him not only *Banksia*

Caleyi (which Mr. Cash, by a slip, calls an "Orchidaceous plant"—p. 34), but also the genera *Caleya* and *Caleana*. We have also an account of the Banksian Society of Manchester, which, though only short-lived—it was formed in 1829 and dissolved in 1836—may claim to have been the precursor of the various natural history societies which have since been established in Manchesier.

It is somewhat unfortunate, as it seems to us, that the uniform character of the book is interfered with by the introduction of "two Lancashire botanists not in humble life, John Just and William Wilson." The space occupied by their notices might have been better filled by references to other working men who have distinguished themselves as naturalists, such as John Bohler, of Sheffield, whose death was recorded in this Journal for 1872, p. 384; and Peter Mackenzie, who is still alive, of whose early life an interesting sketch is given in "Chambers' Edinburgh Journal" for May 11, 1850. J. B.

A Manual of Botany, including the Structure, Functions, Classification, Properties, and Uses of Plants. By Robert Bentley, F.L.S. Third Edition. London: Churchills. 1873. (Pp. 816.)

It is but three years ago that we noticed at some length (Journ. Bot., 1871, p. 88) the second edition of this popular student's text-book. The author has a right to point with satisfaction to the sale of the whole of this in a little over two years as a sufficient proof of the utility of his work. In the present edition much new matter has been added without increasing the bulk of the volume, and the whole text has undergone a thorough revision. As always, the strong point of the book is the very comprehensive account of the properties and uses of plants arranged under each natural order. This has been carefully brought up to the present time, and contains a very large amount of information on economic and medicinal Botany in a small compass. On the other hand the physiology of vegetation is treated in mere outline; indeed this portion of the book cannot be said to be on a level with modern science, many of the recent important researches of German and French physiologists being unnoticed. Several new woodcuts have been introduced; it may be suggested that some others have done duty too long, and require renewal. H. T.

The Treasury of Botany; a Popular Dictionary of the Vegetable Kingdom. Edited by John Lindley, M.D., &c., and Thomas Moore, F.L.S., &c., assisted by Numerous Contributors. New and Revised Edition, with Supplement. London: Longmans and Co. 1874. (Pp. 1352.)

This new edition of one of the most generally useful books on Botany ever printed is very acceptable, especially as it appears to have been carried up to the present time with as much care to ensure general accuracy as was bestowed on the first edition. During the eight years that have since elapsed a number of important new plants have been discovered or described, and much additional information accumulated with reference to those previously known, the whole involving a considerable increase in the amount of material. As the text was unfortunately stereotyped, however, the alterations and additions in the body of the book could not be extensive, but as much as possible has been intercalated. It is to be regretted that convenience of reference, a matter of the first importance in a dictionary, has been unavoidably interfered with by the relegation of the great bulk of the new matter to a supplement. This occupies nearly 100 pages, the greater part of the articles having been contributed by Dr. Masters, Mr. Britten, Prof. T. Dyer, and Mr. J. R. Jackson, names which will be a sufficient guarantee that the information is trustworthy. As an indication of the late date up to which this supplement is brought may be instanced an account of the "Saxaul" plant (*Anabasis Ammodendron*) as met with in the Khivan expedition, and descriptions of *Symea*, *Schizobasis*, and other genera recently described in this and other journals. It is of course difficult to know how much to include in an encyclopædia of this kind, and it is impossible to make it so comprehensive that further additions could not be suggested, and several names might be mentioned as worthy of being included which have no place in the enumeration. But as a rule anyone consulting the book will find what is required, and clear and definite information upon it. Experience has indeed proved its usefulness, and probably no one work on Botany can be so confidently recommended to any person, botanist, commercial man, or general reader, wishing to obtain a good general knowledge of the vegetable world, as these two stout little volumes, the low price of which is within the reach of all likely to require them.

H. T.

Botanical News.

ARTICLES IN JOURNALS.—DECEMBER, 1873.

Grevillea.—M. J. Berkeley, "Notices of North American Fungi" (contd.).—B. Carrington, "New British Hepaticæ" (*Riccia bifurca*, Hoff., *R. sorocarpa*, Bisch., *Nardia revoluta*, Lindb.; tab. 18).

Monthly Micr. Journ.—G. Gulliver, "On Crystals in the Testa and Pericarp of several Orders of Plants and in other parts of the Leguminosæ" (tab. 44).

Journ. Linn. Soc. (No. 74, Dec. 3).—Berkeley and Broome, "Enumeration of the Fungi of Ceylon," part 2 (contd.; tab. 2—10).

Flora.—A. Minks, "Obituary of J. F. Laurer."—C. Haussknecht, "On the Species of *Fumaria*, sect. *Sphærocapnos*" (contd.; *F. gaditana*, n.s., *F. malacitana*, n.s).

Hedwigia.—R. Ruthe, "On *Orthotrichum Shawii*."—J. Schroeter, "Remarks on the New Mallow-disease" (*Puccinia Malvacearum*).—A. Geheeb, "Bryological Notes."

Botanische Zeitung.—O. Uhlworm, "On the Development of the Trichome, with special reference to Prickles" (contd.).

Oesterr. Bot. Zeitschr.—K. Schiedermayr, "A Granite Island in the Chalk-hills of Upper Austria."—A. Kerner, "Distribution of Hungarian Plants" (contd.).—J. L. Holuby, "Brambles of Podhrad in Hungary."—H. Kemp, "Supplement to Flora of Neighbourhood of Vorarlberg" (contd.).

Botaniska Notiser (15 Dec.).—J. E. Areschoug, "On Scandinavian Algæ nearly allied to *Dictyosiphon fœniculaceus* or readily confounded with it" (*Phlæospora*, gen. nov. = *Scytosiphon fœniculaceus*, Lyngb.).

New Books.—J. D. Hooker and others, "Flora of British India," part 2, *Polygalaceæ—Geraniaceæ* (Reeve and Co., 10s. 6d.).—J. Lindley, T. Moore, and others, "Treasury of Botany," ed. 2, with Supplement (Longman and Co., 12s.).—"Die Zweite Deutsche Nordpolarfahrt in den J. 1869 u. 1870," vol. 2, Zoology and Botany (Leipsig, 14s.).

The "Nova Acta" of the Royal Academy of Sciences of Upsala for 1873 (ser. 3, vol. viii., fasc. 2) contains a valuable memoir on the *Desmidiaceæ* of Sweden, by P. M. Lundell, with five plates, and a descriptive monograph by S. Henscher of the species of *Peperomia* from Caldas, Brazil, with seven plates.

The "Bericht" of the Senckenberg (Frankfort-on-M.) Society of Natural Science has an account of the vegetation of the Bermudas by J. J. Rein, who also contributes a paper on some remarkable plants from the environs of Mogador.

There has lately been published a well-written handbook to the united parishes of Colvend and Smethwick, situated close upon the south-western border of the Stewartry of Kirkcudbright, and a few miles from the county town of Dumfriesshire. Our correspondent, the Rev. James Fraser, incumbent of the parish, contributes to the handbook a sketch of the botany of the district, with an appendix of the *plantæ rariores* arranged according to their habitats, including *Carex punctata*, recorded in this Journal (1873, p. 47).

The following books are announced for publication:—"Pharmacographia Britannica, a history of Drugs of Vegetable Origin used in Great Britain and British India," by F. A. Flükiger and Daniel Hanbury (Macmillan).—"Primer of Botany," by Dr. Hooker (Macmillan).—"Advanced Text-book of Botany," by Robert Brown (Blackwood).—"St. Helena, a description of the Island, including its Flora," by J. C. Melliss (Lovell Reeve).

Mr. F.A. Lees, F.L.S., of Hartlepool, is engaged in the compilation of a Flora of the West Riding of Yorkshire, and will thankfully accept any information on the botany of the district.

We understand that the "London Catalogue of British Plants" is now all but out of print, and that Mr. Watson has undertaken to prepare a new edition (the seventh) for publication.

At the meeting of the Linnean Society on January 15th some very important alterations in the bye-laws, recently made by a majority of the Council, were, in accordance with the charter, after being read at the two previous meetings, submitted to the Society. Besides some modifications of slight import these alterations consisted of the repeal of the bye-laws which prohibit any Fellow holding an office in the Society to which payment is annexed, and place the election of the paid librarian in the hands of the Society; and of the proposal that this, as well as all paid offices, shall rest solely with the Council. The President proposed to put these various alterations to the meeting *en masse*, a proceeding which naturally met with great opposition, resulting in a definite proposal, duly seconded, that the alterations be taken *seriatim;* the President, however, refused to put the motion to the meeting. As no special notice of the business of the evening had been sent to the Fellows, fewer attended than from the great interest shown in the matter would have been the case had it been generally known to be coming on. Sixty-six members however were present when, after some further discussion, the ballotting commenced, with the result that forty-four voted for the alterations and twenty-one against, there being only one abstention. The charter requires that two-thirds of the members present shall vote in favour of any alterations in the bye-laws in order to carry them, so that the new regulations were passed by the smallest majority. It is perhaps too late to make suggestions now, but we think that under the circumstances it might be well for the governing body to reconsider the propriety of taking advantage of the new laws. A change of such a fundamental character, passed by so narrow a majority, might for the present remain inoperative. It was stated at the meeting that there are several gentlemen, Fellows of the Society, who would be willing to undertake the duties of the new office of "Editor" (to which it is proposed to annex a salary) without payment, in accordance with the time-honoured and honourable practice of the Linnean and the majority of the learned societies. If this is the case, as we have every reason to believe, it is certainly to be regretted that no effort was made to obtain the required help, in accordance with the bye-laws, either by accepting voluntary assistance from one or more Fellows, or by the appointment of an additional unpaid secretary, or, if it be thought that the work would be more satisfactorily performed by a paid servant, by appointing to the post a competent scientific man who is not F.L.S. Any of these courses, whilst equally advantageous to the Society, would have avoided the rough remedy of a repeal of the laws and a severe strain on the charter of the Society.

The Council of the Geological Society have recognised the eminent services done by Oswald Heer, to Palæontological Botany by bestowing on him the Wollaston Medal. His extensive labours during the last thirty years have thrown a light on the biological and physical condition of the globe during the Tertiary Period which has greatly influenced and redirected the science of geology. And this is the more remakable seeing that his observations have been based on materials which are in the eyes of systematic botanists of little or no value. He has, nevertheless, persevered in his often thankless work, and by a long-continued series of observations and the examination of a vast number of specimen, has confirmed or corrected his conclusions, often aided by the fortunate discovery of a flower or a fruit, until now the general results of his investigations are universally acknowledged.

Original Articles.

ON TWO NEW SPECIES OF HERITIERA.

By S. Kurz.

(Tab. 141.)

The genus *Heritiera* was supposed for a long time to consist only of two species, both littoral. To these I added *H. macrophylla*, Wall., a decidedly non-saline species; and Major Beddome described in his "Flora Sylvatica" another new species from West Hindostan, which he called *H. Vespertilio*.

In looking over the species of this genus in the Calcutta Herbarium, I find a marked species without name under Wallich's List, no. 7836, from Sylhet. A figure of this exists amongst Wallich's MS. drawings, marked by him *H. acuminata*, a name which appears also in Voigt Cat. Suburb. Calcutt. Another and well-marked up-country species is *H. dubia*, Wall. MS., of which unfortunately only a figure by Wallich exists; but the characters of this species are so clearly given in the accompanying analysis as to leave no doubt of its being a well-founded species, in spite of its great resemblance to *H. littoralis*. These two species I propose to describe here (the second from a figure only), and give also figures of the most important parts of them in the accompanying plate, copied from Wallich's drawings.

Heritiera acuminata, Wall. MS. ap. Voigt Hort. Suburb. Calc., 103 [t. 141, f. 1—3].—Arbor; folia lanceolata, petiolo utrinque incrassato ⅓-½ poll. suffulta, basi obtusa et trinervia, *longe acuminata*, 3-4 poll. longa, coriacea, subtus tenui argenteo-lepidota; flores parvi, *albi*, pedicellis gracilibus 2-3 linearibus suffulta, paniculam axillarem folio ipso dimidio breviorem lepidoto-puberulam formantes; calyx c. 2 lin. altus, ample campanulatus, extus puberulus, 5-lobus, lobis triangularibus *acutis reflexis;* columna staminea calyce brevior, apice rubello deplanato incrassata et ibidem antheris 10 circumdata; carpella . . .—*Hab.* Hills of N.E. Bengal; Sylhet (Wall. List, 7836).

Heritiera dubia, Wall. MS. in Icon. ined. H.B.C. [t. 141, f. 4—6).—Arbor; folia oblonga ad elliptico-oblonga, petiolo crasso lepidoto ¼-½ pollicari suffulta, basi rotundata v. obtusa, 4-6 poll. longa, *obtusa*, juniora supra sparse aureo-, subtus dense argenteo- lepidota et brunneo-punctata; flores parvi, brunneo-virescentes, pedicello gracili 1-2 lin. longo suffulti, in paniculam axillarem folio multo breviorem puberulam congesti; calyx urceolato-campanulatus, c. 1½ lin. longus, utrinque puberulus, breviter 4-*lobus, lobis obtusis v. rotundatis*; columna staminalis calyce multo brevior, apice conico 5- (s. 8-?) gono antheres 8? sessiles gerens; carpella matura compressa, cuneato-oblonga, c. 1½ poll. longa, uno latere præsertim apicem versus in alam crassam producta, brunnea, lævia.—*Hab* N.E. Bengal (De Silva).

Heritiera macrophylla, Wall. in Voigt Cat. Suburb. Calc., 103; Kurz in Journ. As. Soc. Beng., 1873, 61 [t. 141, f. 7].—Descriptioni l.c. hæcce adde: flores rosei, pedicellis 1-2 lin. longis puberulis suffulti; calyx campanulatus, plus quam 2 lin. longus, dense puberulus, 5- (perraro 6-7-) lobus, lobis lanceolatis acutis; columna staminalis calyce multo brevior, apice incrassato antheras 5 gerente in subulam brevem excurrens.—*Hab.* Occurs also in the hills of Eastern Bengal, as in Munnipore (De Silva); Cachar; Khasya (Griff., no. 606).

I understand that this species is cultivated in the hothouses of Scotland under the gardeners' name of "Lady's Looking-glass."

Description of Tab. 141.

Fig. 1—3. *H. acuminata*, Wall., showing a flowering branch nat. size, and flower and reproductive organs magn.; fig. 4—6. *H. dubia*, Wall., flower and reproductive organs magnified, carpel nat. size; fig. 7. *H. macrophylla*, Wall., fruit nat. size. (All figures copied from Wallich's drawings.)

BOTANICAL BIBLIOGRAPHY OF THE BRITISH COUNTIES.

By Henry Trimen, M.B., F.L.S.

It has been remarked to me by more than one energetic field botanist that the publication of a list of county and district floras, topographically arranged, would be of considerable utility: in the following catalogue I have endeavoured to carry out the suggestion.

The printing and recent distribution of Mr. H. C. Watson's "Topographical Botany" (part 1.) has newly directed attention to the county distribution of British plants. In this useful book each species is traced through 112 counties and "vice-counties" (these latter resulting from splitting up the larger counties), into which Great Britain is divided by the author, and we therefore possess in its pages as many county lists or outline Floras. All quotation of printed matter is, however, purposely omitted in the volume, and there is usually no further information to be gathered from the text than the facts of occurrence or non-record as known to the author, though in its compilation he must have consulted a very large number of books and papers.

County Floras will, it is to be hoped, be some day superseded by Floras of natural tracts of country. No better means of expressing the true bearings of geographical conditions on plant-distribution has been found than the adoption of river-basins as districts, and it would be well if compilers of Floras of counties or other artificial tracts would carefully distinguish, as has been done by several, between the vegetation of the portions of different basins coming within their area by the employment of districts founded on the natural drainage. One great advantage which would necessarily result were this practice generally followed would be the completion of the Floras of the large river-basins of England by the fitting together of the parts of their area lying in different counties, just as in a child's puzzle the different objects of the picture are made up by the juxtaposition of several pieces, each thus well representing a county with its artificial boundaries.

It is unfortunate, but was at the time unavoidable, that our leading topographical botanist, Mr. Watson, in constructing his eighteen primary "provinces," maintained the county boundaries. His plan was to form "groups of counties, which together constitute the basin of a principal river, or have some other peculiarity in common," from which it of course resulted that, though distinguished usually by the name of some large river, the "provinces" by no means correspond to the districts respectively drained by the streams whose names they bear. Other circumstances, mentioned in the "Cybele Britannica," also contributed to render the primary "provinces" still more artificial.

The following list of books and papers on local botany is arranged under the heads of the counties which follow the sequence of Mr. Watson's works. Immediately after the name of the county, in square brackets, are the numbers and names of the "vice-counties," and the name of the "province," as given in the same books, and after these is an outline of the natural drainage, as an indication for dividing the county into districts.*

Then follow the local Floras, which are thus arranged:—1. When there exists a complete Flora of the county it is given first, with some indication of its scope and character. 2. The partial Floras are classed in this way: first come references to the county lists of "rarer plants" in the following general botanical guides:—Gibson's edition of Camden's "Britannia," 1695, the lists communicated by Ray, except Middlesex by Petiver (Gibs.).—Appendix to T. Martyn's "Plantæ Cantabrigienses," 1763 (Mart.).—Gough's edition of Camden's "Britannia," 1789, the lists communicated by various botanists (Gough).—Turner and Dillwyn's "Botanist's Guide," 1805 (B. G.).—H. C. Watson's "New Botanist's Guide," 1835-37 (New B. G.).—Cooper's "Flora Metropolitana," 1836-37 (Cooper). Then follow references to other county lists of rarities or selected species, and occasionally to books containing scattered information on the botany of the county or some district in it. Lastly come the various local catologues or Floras under the heading of the town or district to which they refer, with occasional remarks. 3. I have made a note of the herbaria of authors of local Floras or well-known collectors which have since become the property of museums or societies, and are thus common scientific property, as well as of other public collections.

It is evident that the plan here adopted does not exhaust all existing plant-records. It is primarily only a list of professedly *local* treatises. Where the authors of such books have been laborious and conscientious, they have carefully collected what has been done by previous botanical writers, and in some few cases have endeavoured to include everything from the earliest attainable records. As a general rule, however, the old (ante-Linnean) writers have been but little consulted by the compilers of local catalogues, and, indeed, even more recent authors are frequently neglected. But the examination of a number of local Floras has revealed much carelessness in this particular, and it is very difficult to ascertain in many cases how far previously-written books have been quoted. Besides the localities scattered through the ponderous volumes of the old herbalists, there are numerous ones in the general British Floras, from How's "Phytologia" (1650) down to the present time; it is of course impossible to refer more definitely to these.

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* The natural watersheds of England are well shown in the small "Physical Map of England and Wales," published by Stanford, Charing Cross.

A small class of books requires to be noticed consisting of Floras or catalogues for districts larger than counties, but not referring to the whole country; the several Scotch Floras, the Northern Flora, Purton's Midland Flora, Irvine's London Flora, Balfour's Edinburgh Flora, and many accounts of botanical tours are examples; these however are generally mentioned under the county to which they chiefly refer. Two other books will scarcely fall under any category—Blackstone's "Specimen Botanicum," 1746, consisting of localities in various parts of England, the plants arranged in alphabetical order; and Milne and Gordon's "Indigenous Botany," 1793 (of which but one volume was published), in which are numerous localities in the south-east of England. But the great storehouses of short lists, isolated localities, &c., are the various botanical and natural history periodicals and magazines; only the more important and longer lists from this source are referred to in the following catalogue. Lastly, it should be mentioned that the great public herbaria are full of localities, many of them unpublished; this is especially the case with the British collection at the British Museum.

I do not suppose that there are not many omissions in the following list; it is almost impossible to discover all the locally printed lists and publications of country scientific societies. I shall therefore be grateful to any reader who can add any particulars if he will send them to me that they may be incorporated, as well as any notes on the counties not included in this first instalment.

CORNWALL.—[1 West, 2 East; artificially divided. Pr. *Peninsula.*] Drains N. & S. from a central high watershed running down whole length of county. Plants of N. & S. should be distinguished.

1.—I. W. N. Keys, Flora of Devon & C., 1866-70 (Trans. Dev. & Corn. Nat. Hist. Soc.). No districts. List of authors quoted given, old writers neglected. Arranged by Bab. Man., ed. 5. Mosses and Lichens by E. M. Holmes.

2.—Gibs., 23.—Mart., 44.—Gough i., 22.—B. G., 124.—New B. G., 6, 547.—Jones's Botanical Tour, 1820, with appendix.—J. Jacob, W. Devon & C. Flora, 1836-37, vol. i. Only goes to end of Tetrandria.—W. S. Hore in Phytol. i., 160 (1841).—F. P. Pascoe in Bot. Gaz. ii., 37 (1850).—James Irvine in Naturalist iii., 115 (1866).

Falmouth.—H. C. Bastian in Rep. R. C. Polytechnic Instit., 1856. Algæ by Miss Warren, ib., 1849.

Lizard.—C. A. Johns, Week at the Lizard.—J. G. Baker in Journ. Bot., 1871-72.

North Cornwall.—W. M. Hind, J. G. Baker, W. Wise, and T. R. A. Briggs in Journ. Bot., 1873.

Polperro.—T. Q. Couch in Rep. R. C. Polytechn. Inst., 1848.

Plymouth, neighbourhood of.—T. R. A. Briggs in Journ. Bot., 1863, et seq.

Penzance.—C. B. Allen in Rep. R. C. Polyt. Inst., 1872.—W. Curnow, Phyt. i., 1143.—Jungermanniæ, W. Curnow, Phyt. i., 609.—Mosses, A. Greenwood, Phyt. i., 997.

Scilly Isles.—F. Townsend in Journ. Bot., 1864, p. 102.

3.—Herbarium of Penzance Nat. Hist. Soc.—Herb. Plymouth Instit.—Herb. R. Hortic. Soc. Cornwall.

DEVON.—[3 South, 4 North; "separated by an imaginary line adapted to the watershed." Pr. *Peninsula.*] Rivers Torridge and Taw flow N. into Bristol Channel; Tamar, Dart, Exe, &c., S. into Eng. Channel.

1.—J. P. Jones and J. F. Kingston, Flora Devoniensis, 1829. Descriptive. Linnean system & Nat. syst. No districts. Cryptogams included.—T. P. Ravenshaw, New List of Fl. Plants & Ferns of D., 1860. No districts, localities badly arranged, many inaccuracies, authors quoted given.—I. W. N. Keys, Flora of D. & Cornwall (see Cornwall), 1866-70.

2.—Gibs., 42.—Gough i., 41.—B. G., 194.—New B. G., 12, 550.—Jacob, W. Devon & Cornwall Flora, 1836-37.—N. B. Ward in Phyt. i., 20 (1841).—W. S. Hore in Phyt. i., 160 (1841).—Bellamy, Nat. Hist. S. Devon, 1840.

Chudleigh.—Halle, Fl. of C., 1851.—List in Appx. to Jones Bot. Tour, 1820. Includes Cryptogams.

R. Axe.—Edwards, Ferns of the A., 1862.

Dartmoor.—Moore in Perambulation of D., 1848.

Plymouth.—Banks, P. & Devonport Fl., 1830.—T. R. Archer Briggs in Journ. Bot., 1863, et seq.

Tiverton.—Mackenzie in Ann. Rep. of D. Ass. for Adv. of Sc., 1865.

Totnes.—S. Hannaford, Flora Tottoniensis, 1851; Suppt., 1852.

Sidmouth.—Cullen, Flora Sidostiensis, 1849.

Torquay.—Stewart, Fl. of T., 1860. 25 miles' circle. Descriptive.—M. Wyatt, Algæ Damnonienses (dried specimens), 1834, &c.

Braunton Burrows.—Ravenshaw in Phyt., N.S., 1862, 355.

Barnstaple, &c.—G. Maw in Phyt. iv., 785 (1853).

Teignmouth.—Jordan in Phyt. i., 827.

3.—Herb. of Torquay Nat. Hist. Soc. in T. Museum, includes Miss Griffiths' Algæ.

SOMERSET.—[5 South, 6 North; artificially divided. Pr. *Peninsula.*] Chiefly drained by small rivers flowing N. into Bristol Channel, but small portions by Exe, Axe, and Stour flowing S. into English Channel.

1.—No complete Flora. Ferns, Newman in Phyt. i., 964.

2.—Gibs., 83.—Mart., 92.—Gough i., 85.—B. G., 519, 747.—New B. G., 27, 553.—See Turner, Herball, 1551-68; Lobel, Adversaria, 1571; Howe, Phyt. Brit., 1650.

Bath.—Babington, Flora Bathoniensis, 1834; Supp., 1839.—Additions to, in Proc. Bath Nat. Hist. Field Club, 1867.—List of Fungi, ibid., 1868.

Bristol.—Swete, Fl. of B., 1854. Localities in S. distinguished from those in Gloucestershire. No Cryptogams.—Flower in Phyt. i., 68.—Freeman, ib. i., 327.—H. O. Stephens in West of England Journal.—E. Chandler in Naturalist 1866, 281.

Weston-super-Mare.—St. Brody, Flora of W., 1856.

Wells.—T. F. Ravenshaw in Phyt., N.S., 1857, 130.—Sole in J. Collinson's History of S., 1791, Introduction, pp. xvii-xxii.

3.—Rev. L. Jenyns' Herbarium in Museum of Bath R. Lit. & Sc. Inst.—Bristol Nat. Soc., forming a local herbarium.—Rev. W. Tuckwell collecting localities round Taunton.

WILTS.—[7 North, 8 South; artificially separated by Kennet and Avon Canal. Pr. *Channel.*] Drains into three basins: E. into the Bristol Avon, S. into the Christchurch Avon, N.W. into the Isis (Thames).

1.—T. B. Flower, Flora of W., in vols. iv. and following of W. Arch. & Nat. Hist. Mag., 1857-73 (15 parts issued, one more to complete the Flora). Five artificial districts. Cryptogams not contemplated.—Fungi, C. E. Broome in Wilts A. & N. H. Mag., 1863.

2.—Gibs., 114.—Gough i., 114.—B. G., 651.—New B. G., 45, 564.—Aubrey's Memoires, MSS. in Royal Society's Library, 1685.

Salisbury.—H. Smith, Flora Sarisburiensis, 1817, illustrated; 4 nos. pubd.—Maton, Nat. Hist. of part of W. 10 miles round S., 1843. Alphabetical. Includes Cryptogams.

Pewsey.—Ravenshaw, Phyt., N.S., iii., 103, rare plants.

Marlborough.—Preston, Fl. of M., 1863. 6 miles' radius, 4 artificial districts. No Cryptogams. New edition being issued in M. Nat. Hist. Soc. Reports (finished to Calycifloræ). Additions, Britten in J. Bot., 1870, 324; 1871, 374.

Andover.—Clarke's List includes some W. localities (see Hants).

3.—Herbarium at Marlborough College.—A. B. Lambert's plants at Oxford and Linnean Society.

DORSET.—[9. Pr. *Channel.*] Drains almost entirely S. into English Channel, a small piece N. into River Parret.

1.—J. C. Mansel-Pleydell, Flora of D. All printed; publication expected immediately.

2.—Gibs., 55.—Gough i., 54.—B. G., 213.—New B. G., 39, 563.—See Lobel, Adversaria, 1571.—Pulteney in Hutchins' Hist. of D., 1799. Additions, 1813.

Poole.—Bell-Salter, Account of Bot. of P., 1839.

I. of Purbeck.—Fungi by C. E. Broome, in Papers read before the P. Society.

Swanage.—Mansel-Pleydell in Guide to Swanage, 1873.

Weymouth.—G. S. Gibson in Phyt. i., 735.

Portland.—H. Groves in Phyt., N.S., 1858, 601.

3.—Pulteney's Herbarium in British Museum.

ISLE OF WIGHT.—[10. Pr. *Channel.*]

1.—W. A. Bromfield, Flora Vectensis, 1856. Full descriptions given. Two districts artificially divided by Medina River. Previously printed matter included. Cryptogams not included.

A. G. More, Catalogue of Fl. Plts. & Ferns of I. of W., 1868. To serve as an index to Dr. Bromfield's Herbarium.—Supplement to the Fl. Vectensis, A. G. More in Journ. Bot., 1871, pp. 72, 135, 167, 202.—Tucker in Journ. Bot., 1871, p. 295.

2.—[W. D. Snooke], Flora Vectiana, 1823. Linnean System. Rarer species. Garnier in Hampshire Repository, 1798; 32 species mentioned. See also under Hants.

3.—Dr. Bromfield's I. of Wight Herbarium in Museum of I. of W. Philosophical Soc. at Ryde. His MSS. and some of his plants at Kew.

HANTS.—[11 South, 12 North; artificially divided. Pr. *Channel.*] Chiefly drains into the Channel; N.E. portion belongs to the Thames basin.

1.—W. A. Bromfield in Phytologist, vols. iii. & iv., 1848-51. Includes I. of Wight. No districts. Cryptogams not included. Additional localities from Dr. B.'s herbarium at Ryde, Phyt., N.S., iii., 1860, p. 80.

2.—Gibs., 134.—Mart., 50.—Gough i., 145.—B. G., 312.—New B. G., 46, 566.—Garnier in Hampshire Repository, 1798, p. 114. Rarer plants arranged on Linnean system.—See Merrett's Pinax Rer. Brit., 1666. All include also I. of Wight.

New Forest.—Wise, Book of the N. F., 1862. Full list of Phanerogams.—Additions, Trimen & Dyer in Journ. Bot., 1864, 316.—See also Withering's Nat. Arr. Br. Plants, ed. 3, 1796.

Andover.—C. B. Clarke, List of Pl. of A., 1866. 10 miles' radius. A few Mosses included.

East Woodhay.—Reeks in Trans. Newbury Dist. Field Club, 1872.

Portsea Island, Gosport, &c.—Trimen in Phyt., N.S., 1863, 390.

Selborne.—White's Nat. Hist. S., 1788.—Bell-Salter in Phyt. i., 1132, & Rubi ii., 97, 131.

Wellington.—Penny in Rep. Well. Coll. Nat. Hist. Soc., 1872.

Winchester.—Warner in Rep. W. & Hampshire Sc. & Lit. Soc., 1872.

Fareham.—Notcutt in Phyt. ii., 201, 491.

3.—Many of Dr. Bromfield's plants, and his MSS. at Kew.—Mr. R. S. Hill's (of Basingstoke) Herbarium at Winchester & H. Sc. & Lit. Soc.—Herbarium at Wellington College; at Winchester College.—Mrs. Robinson's (of Fareham) Herbarium in Brit. Mus.

Mr. F. Townsend, of Shedfield Lodge, near Fareham, is engaged on a Flora of the county.

SUSSEX.—[13 West, 14 East; separated by high-road from Brighton to Cuckfield. Pr. *Channel.*] Mainly drains into the Channel;

small parts of North drained by Mole (Thames basin) and Medway.

1.—No complete Flora.

2.—Gibs., 183.—Mart., 100.—Gough i., 207.—B. G., 596.—New B. G., 51, 571.—T. H. Cooper in App. to Horsfield's History of S., 1835. Rarer plants, no districts, numerous localities, includes Cryptogams.—W. B. Hemsley in Journ. Bot., 1868, 194, 258; 1872, 299.—C. P. Smith, Moss Flora of S.

Eastbourne.—Catalogue compiled by E. Nat. Hist. Soc. in Eastbourne Guide, 1873. Includes Cryptogams.

Brighton.—Mrs. Merrifield, Nat. Hist. of B., 1860. Includes Cryptogams.—Ibid., Marine Algæ, Phyt., N. S., 1863, 513.

Tilgate Forest.—Lloyd & McEnnes in Phyt. iv., 633.

Hastings.—H. Past and Present. List of plants.

See also the Floras of *Tunbridge Wells* and *Reigate.*

3.—Mr. Borrer's Herbarium at Kew.

Mr. W. B. Hemsley, late of the Kew Herbarium, has collected material for a Flora of the county.

KENT.—[15 East, 16 West; separated by R. Medway and tributaries. Pr. *Thames.*] N.W. part is in Thames basin, principally drained by Medway; E. portion by Stour; S. part into Channel.

1.—No complete Flora.

2.—Gibs., 225.—Mart., 51.—Gough i., 250.—B. G., 338.—New B. G., 64, 576.—Cooper, 46; Supp., 9.—See Gerarde, Herball, 1597; Johnson's Gerarde, 1633; Parkinson, Theatr. Bot., 1640; Blackstone, Spec. Bot., 1746.—T. Johnson, Iter plantarum investigationis ergo susceptum, 1629. N. Kent.—Ib., Descriptio itineris Plant. inv. ergo suscept in Agrum Cantianum, 1632, N. & E. Kent.—Petiver, Tour from London to Dover, 1714 (Sloane MSS.); printed in Phyt., 1862., p. 115.—G. E. Smith, Cat. of Rare Plants in South K., 1829. Linnean system; central point, *Sandgate.*—M. H. Cowell, Floral Guide to East K., 1839. Plants arranged under localities.—Milne & Gordon, Indigenous Botany, 1793.—N.E. & S. Kent. Anon., Phyt., N. S., 1861, 177, 207, 238, 335, 371, 374; 1862, 18, 50, 83, 129, 173.—Bot. of district bet. rivers Cray, Ravensbourne and Thames in Rep. of Greenwich Nat. Hist. Soc.

Faversham.—Jacob, Plantæ Favershamienses, 1777.—Cowell, Floral Guide to E. K., 1839, part i. Arranged under localities and times of flowering, good map.—H. A Stowell in Phyt., N. S., 1855, pp. 249, 375; 1857, pp. 100, 153, 180, 261.

Thanet.—Flower, Flora Thanetensis, 1847.

Dover.—Dillwyn in Trans. Linn. Soc. vi., 177 (1801). Includes Cryptogams.—Paley, Wild Fls. of D. and neighbourhood. —H. C. in Phyt., N. S., 1861, p. 33.

Folkestone.—List of Plants (Creed's Library), 1870. Only English names.

Lydd—Dowker, Reid & Martin, Observations on Romney Marsh & Lydd Beach, &c.

Tunbridge Wells.—T. F. Forster, List of Rare Pl., 1801.—Flora Tonbridgensis, 1816, ed. 2, 1842.—Jenner, Flora of T. W., 1846.—A. G. More in Phyt., N. S., 1855, 292, 345.—R. Deakin, Fl. Plants of T.W. and Neighbourhood, 1871.

Bromley.—Agarics. G. Sparkes, Phyt. i., 1000.

Keston Common.—Anon. in Phyt., N. S., 1860, 377; 1861, 384.

Herbarium of Folkestone Nat. Hist. Soc.

East Kent Nat. Hist. Soc. has made some collections towards a Flora of E. K.—Mr. F. J. Hanbury, of Stoke Newington, is engaged in compiling a complete county Flora.

SURREY.—[17. Pr. *Thames.*] Almost entirely in Thames basin; small part of S.W drains S. into Channel.

1.—J. A. Brewer, Flora of S., 1863. Arranged by Lond. Cat., ed. 5. Nine artificial districts. No list of authors quoted given. Cryptogams not included. Old authors not consulted. Southern suburbs of London much neglected. Supplement, H. Trimen in Journ. Bot., 1864, p. 70; includes some of the older authorities (Martyn, Curtis).

2.—Gibs., 166.—Mart., 94.—Gough i., 180.—B. G., 577.—New B. G., 84, 579.—Cooper, 1; Supp., 1.—J. D. Salmon on botanical divisions of county in Phyt. iv., 558 (1852).—See Merrett's Pinax, 1666.

Battersea & Clapham.—W. Pamplin, Catalogue of rarer plants, 1827.

Reigate.—Luxford, R. Flora, 1838.—Additions, Holman in Phyt. i., 52.—New R. Flora, 1856.—J. S. Mill in Phyt., N. S., i., 337.

Godalming.—Salmon in Phyt. ii., 447.

Farnham.—W. W. Reeves in Bot. Gaz. ii., 76 (1850.)

3.—Mr. Salmon's Herbarium.

Mr. Brewer has made collections towards a supplement to his Flora.

(*To be continued.*)

OBSERVATIONS SUR LES ROSA BALEARICA, *Desfontaines*, ET R. VOSAGIACA, *Desportes*.

PAR A. DÉSÉGLISE.

R. BALEARICA (Sect. Cinnamomeæ), Desfont., Cat. Paris (1804) et exempl. authent., in Herb. DC.; Pers., Syn., 2, p. 49 (1807); Dum.-Cours., Bot. Cult. (1811), vol. 5, p. 484; *R. carolina*, var. *lævis*, Seringe in DC. Pr., 2, p. 605; *R. virginiana*, Tratt., Mon. Ros. 2, p. 154.—*Icon.* Redouté, Les Roses (1824), livr. 7, *a.*—*Hab.* Ile Majorque (Desf. in Herb. DC.)

Voici la note de De Candolle, conservée dans son herbier:—“ Sous-arbrisseau de 4-5 décimètres. Aiguillons épars et souvent geminés sous chaque feuille, droits, d'abord rouges puis grisâtres; stipules entières un peu ciliées. Feuilles à 5 folioles elliptiques pointues des deux côtés, dentées en scie presque dès la base. Pétioles munis de quelques petits aiguillons. Pédoncules et ovaires chargés de quelques poils glanduleux, ovaire ovale sphérique; divisions du calice presque égales,

entières, chargées en dessous de poils glanduleux ; pétales roses obtus, stigmates un peu velus."

Voici la description minutieuse que j'ai établie sur l'unique échantillon conservé dans l'herbier De Candolle.—Arbrisseau . . . . ; ramuscule (haut de 15 cent.) à écorce verdâtre portant vers son sommet sous un pétiole, deux petits aiguillons grêles, fins, droits, horizontaux, opposés, dilatés à la base en forme de disque ; le ramuscule porte trois pétioles : un pétiole glabre, inerme, les deux autres ont deux petits acicules grêles et quelques poils en dessous, tous canaliculés en dessus ; 5-7 folioles elliptiques, aiguës aux deux extrémités, la terminale longuement pétiolée, les latérales presque sessiles, vertes en dessus, glauques en dessous, il y a quelques folioles qui ont la nervure médiane parsemée de rares poils argentés, simplement dentées à dents aiguës ; stipules étroites, glabres à oreillettes aiguës, ciliées ; le ramuscule a deux pédoncules, grêles, légèrement aciculés, l'un de ces pédoncules porte un bouton prés de s'épanouir, l'autre a la fleur ouverte ; deux bractées opposées, ovales, cuspidées, glabres, plus courtes que les pédoncules ; tube du calice petit, ovoïde, glabre ; divisions calicinales entières, lancéolées, spathulées au sommet, glanduleuses en dessous à glandes fines, les intérieures en outre tomenteuses aux bords, saillantes sur le bouton, plus longues que la corolle, étalées à l'anthèse ; fleurs . . . (difficile de se prononcer pour la couleur sur un échantillon ancien) ; styles libres ! très velus, courts, disque peu apparent ; fruit . . . .

Observation.—Lindley, Monog. of Roses, p. 117, et Trattinick, Monog. Ros., 2, p. 97, considèrent le *R. balearica*, Desfont., comme étant la meme plante que le *R. sempervirens*, Lin. ; pour appartenir à ce dernier il faudrait que les styles fussent soudés en colonne : ce qui n'existe pas. Desvaux, Journ. Bot. (1813), vol. ii., p. 108, connaissait-il le *R. balearica*, Desfont. ? Le doute est permis quand il dit : "que ce rosier ne peut être considéré que comme une très-légère variété du *R. sempervirens*, Lin." Desvaux avait sans doute oublié de regarder la conformation des styles ? Wallroth, Histor. Ros., p. 145, fait de la plante de Desfontaines la variété β. de son *R. cretica*, qui sous ce nom comprend le *R. montana*, Chaix ; *R. Seraphini*, Viv. ; *R. Doniana*, Woods ; *R. orientalis*, Dupont ; *R. glutinosa*, Sibth. La synonymie bizarre de Wallroth permet aucune discussion. Persoon, Syn. ii., p. 49, dit que le *R. balearica*, Desfont., est voisin du *R. pumila*, Lin. ; mais ce rosier n'a rien des caractères du groupe des *gallicanæ* pour faire une semblable assimilation. Dumont de Courset, Bot. Cultiv. (1811), vol. v., p. 484, place le *R. balearica*, Desfont., après le *R. alba*, Lin. ; puis à la fin de sa description il dit : "Cette espèce a des rapports au No. 26 (*R. pumila*)." Cette comparaison a été sans doute établie d'après Persoon ? Seringe in DC. Prod. ii., p. 605 ; place le *R. balearica*, Desfont., dans le groupe du *R. carolina*, Lin., et devient sa variété *b. lævis ;* à la quelle il ajoute en synonyme le *R. corymbosa*, Ehrh. (non Bosc. nec Dup.) ; puis cite la figure de Redouté, vol. i., p. 84, *opt.* Seringe était plus dans le vrai en considérant le *R. balearica*, Desfont., comme devant appartenir au groupe du *R. carolina*. Trattinick, l.c., p. 154, sous le nom de *R. virginiana* (non Du Roi), décrit il nous semble le *R. balearica*, Desfont., puis il dit de la planche de Redouté : "An species distincta ?"

planche regardée comme bonne par Seringe pour le rosier de Desfontaines.

Si le *R. corymbosa*, Ehrh., est réellement le *R. carolina*, Lin., comme le dit Lindley, le nom de *R. balearica*, Desfont., doit être conservé.

R. virginiana, *Miller* (1759) = R. blanda, *Jacq.*
R. „ *Herm.* (1762) = ? R. stricta, *Mull.* ex *Lindl.*
R. „ *Du Roi* (1772) = R. carolina, *Lin.* ex *Lindl.*
R. „ *Ræssig* (1800) = R. carolina, *Lin.*
R. „ *Tratt.* (1823) = R. balearica, *Desf.*
R. corymbosa, *Ehrh.* (1789) = R. carolina, *Lin.* ex *Lindl.*
R. „ *Dup.* (1809) = R. Hudsoniana salicifolia, *Red.*
R. „ *Bosc.* (1821) = R. blanda, *Jacq.*

R. VOSAGIACA (Sect. Montanæ), Desportes, Roset. Gall. (1828), p. 88; *R. glauca*, Villars! in Lois. Jour. Bot. de Desvaux (1809), vol. ii., p. 336 (non Desfont.); Lois. Notice (1810), p. 80; Poir., Dict. Enc. sup. iv., p. 716; Tratt., Monog. Ros. ii., p. 223; *R. canina glauca*, Desv., Jour. Bot. (1813), ii., p. 116; *R. rubrifolia*, var. *pinnatifida*, Seringe! Mus. Helv. (1818), fasc. i., p. 11, et in DC. Pr. ii., p. 610; Dub. Bot. i., p. 177; *R. rubrifolia*, var. *Reuteri*, Godet!, Fl. du Jura (1853), p. 218; *R. Reuteri*, Godet!, in Reuter, Cat. de Genève (1861), p. 68; Déségl., Essai Monog., in Mém. Soc. Acad. de Maine-et-Loire, vol. x., p. 99 et extr., p. 59; Gren. Fl. Jur. (1864), p. 238, *part.*; Cariot Etud. des Fleurs (1865), vol. ii., p. 175; Fourreau, Cat., p. 69; Verlot, Pl. Dauph. (1872), p. 115; *R. monticola*, *a. Reuteri*, Rapin!, Guid. Cant. de Vaud (1862), p. 194; *R. alpiphila*, Arvet-Touvet!, Essai sur les Pl. du Dauph. (1871), p. 27 ex exempl. authent!; *R. montana germinibus glabris*, Schleicher, Cat. (1815), p. 46.—*Icon.* Seringe, l.c., tab. ii., f. 2.—*Exsic.* Billot, No. 3581 et No. 3581 bis, le numéro bis est un très-mauvais échantillon distribué sous le nom de variété "*foliis biserratis*"; ce que nous avons reçu a les feuilles simplement dentées, Déséglise, Herbarium Rosarum, no. 63.

Arbrisseau de 1 à 2 mètres, rameux à rameaux purpurins ou verdâtres, aiguillons robustes, blanchâtres dilatés à la base, crochus ou presque droits, ceux des rameaux plus petits; pétioles glabres purpurins ou verdâtres, inermes ou munis de très-petits aiguillons; 5-7 folioles ovales ou obtuses, toutes pétiolées, les unes arrondies à la base, d'autres arrondies au sommet et cunéiformes à la base ou aiguës aux deux extrémités, fermes, coriaces, nerveuses, glauques, un peu rougeâtres sur les nervures et les jeunes pousses, simplement dentées à dents aiguës plus ou moins profondes (je ne vois pas sur les nombreux échantillons que j'ai en herbier de cette plante des aiguillons sur la nervure médiane comme le dit M. Grenier, l.c., mais il faut dire que cet auteur décrit plutôt un groupe de formes qu'un vrai type); stipules grandes, plus ou moins lavées de pourpre, glabres, dilatées, souvent terminées par un appendice foliacé, les autres à oreillettes aiguës plus ou moins droites ou divergentes, bordées de glandes; pédoncules courts, glabres, solitaires ou réunis 2-4 en bouquet ayant à leur base de larges bractées ovales, lavées de pourpre, glabres, cuspidées au sommet, qui cachent entièrement les pédoncules; tube du calice subglobuleux ou ovoïde, glabre; divisions calicinales lancéolées, acuminées, glabres, trois pinnatifides, deux entierès, réfléchies après l'anthèse, puis redressés et caduques au commencement de la maturité du fruit; styles velus; corolle assez grande d'un rose vif; fruit gros subglobuleux ou ovoïde, d'un rouge orangé.

Hab.--Juin, juillet. Vallées et broussailles des montagnes.—FRANCE —*Savoie*, mont Joigny, mont Nivolet (Songeon), montagne des Chaires (Perrier); *Haute-Savoie*, Haberès-Lullin, la Glappaz, Reyvroz (Puget), le mont Salève; *Puy-de-Dôme*, Fontanat près de Clermont!; *Jura*, Salins!, mont Poupet!; *Doubs*, Pontarlier!; *Vosges*, Champ du Feu (Mougeot, 1814, in Herb. DC.! sub nom. *R. glauca*, Villars), ballon de Saint-Maurice (Pierrat), Gérardmer!; *Basses-Alpes*, Saint Paul de Vars (Arvet-Touvet); *Hautes-Alpes*, La Grave (Ozanon), mont Bayard sur Gap (Gariod); *Isère*, forêt de Portes, montagne de la Salette (Verlot); *Lozère*, Mende (Prost, 1815, Herb. DC.); *Pyrénées-orientales* (Coder, 1814, Herb. DC.).—ESPAGNE.—Pyrénées-d'Aragon, Lessera (Timbal-Lagrave).—SUISSE.—*Cant. de Fribourg*, Tine près de Montbovon!; *Cant. de Berne*, Adelboden au fond du Simenthal (Seringe, 1815, Herb. DC.); *Valais*, Bovernier!, Salvan!, la Forclaz!; indiqué par M. Christ, " Die Rosen der Schweiz," dans les Cantons de Vaud, de Neuchâtel, de Schaffhouse.—PRUSSE.—Harz (Wallroth, 1834, Herb. DC.), Schlosswald (Garke, Herb. Royal de Koenigsberg), Kupyker Wald. Kiauten (Sanio, Herb. Royal de Koenigsberg).—ANGLETERRE.—Lancashire, Sephton (Webb).—BELGIQUE.—Indiqué dans les montagnes boisées du Limbourg, par Lejeune (Revue de la Flore de Spa). Nous ignorons la plante de Lejeune.

Obs.—1809. Il est parlé pour la première fois du *R. glauca*, Villars, par Loiseleur-Deslonchamps en 1809, dans sa "Notice sur les plantes à ajouter à la flore de France," editée par Desvaux dans son journal botanique et dont le tirage à part fut effectué en 1810. "*Rosa glauca*, Villars, inédit. *R. germinibus* ovatis pedunculisque glabris, calycinis laciniis pinnatifidis, foliolis ovatis glaucis, aculeis sparsis." Ce rosier croît dans les montagnes des Vosges; il m'a été communiqué par M. Mougeot.—1813. Desvaux, l.c., série 2, vol. 2, p. 116, " Disposition méthodique des espèces de rosiers naturels au sol de la France," croit devoir réunir cette plante au *R. canina* et en fait sa variété "*glauca*"; *R. glauca*, Vill. (non Desfont.); le *R. glauca*, Desf., est de 1808 et correspond au *R. rubrifolia*, Villars.—1815. De Candolle, " Flore française," vol. 5, p. 358, dit: " Sous le nom de *R. canina*, je comprends tous les rosiers à fruit ovoïde, glabre ainsi que le pédoncule; à folioles glabres, simplement dentées en scie; à tiges et pétioles munis d'aiguillons crochus, à styles libres, à fleurs variant du rose vif au rose le plus pâle; quoique ce caractère exclue plusieurs des variétés réunies à cette espèce par divers auteurs, il en reste encore un nombre très-considérable, et parmi les quels il se trouvera probablement quelques espèces dignes d' être admises: le *R. glauca*, Vill., in Lois., not. p. 80, remarquable par son feuillage glauque et le rose vif de ses fleurs, paraît être de ce nombre."—1820. Lindley, "Monograph of Roses," admet en synonyme avec un point de doute le *R. glauca*, Vill., à son *R. canina*.—1823. Trattinick, "Monographia Rosacearum," place le *R. glauca*, Vill., dans sa série des

Species minus cognitæ.—1825. Seringe, in DC. Prod., admet au *R. rubrifolia* une variété *pinnatifida* qui est le *R. glauca*, Vill. ! Seringe en décrivant le genre *Rosa* pour le Prodromus, ne fait aucune mention du *R. glauca*, Villars, pas même comme synonyme ! Il y a lieu de s'étonner d'un tel oubli de sa part, puisque la plante a été décrite en 1809, et que l'Herbier DC. possédait le type depuis 1814 ! Le volume du Prodromus date de 1825. Libre à Seringe de ne pas admettre le *R. glauca*, Vill., comme espèce distincte, mais il était juste de le mentionner en synonyme, surtout dans un livre qui passe pour enregistrer tous les faits connus !—1828. Duby, "Bot. gall.," copie Seringe.—1828. Desportes, "Rosetum gallicum," voyant que le *R. glauca*, Vill., n'était pas celui décrit en 1808, par Desfontaines, lui donne le nom de *R. vosagiaca*, Desp. ; *R. glauca*, Vill., in Lois., notice p. 80.—1834. Mutel, "Flore française," ne fait aucune mention du *R. glauca*, Vill., qu'il semble ignorer.—1843. M. Godron, "Flore de Lorraine," dans la première comme dans la seconde édition, parle nullement de ce rosier ; cependant l'Herbier de Mougeot était à sa portée ! Il y a lieu de s'étonner d'un tel oubli, l'espèce de Villars ayant pris naissance dans les Vosges !—1847. Gonnet, "Flore élémentaire de la France," ne fait aucune mention de ce rosier.—1848. Grenier et Godron, "Flore de France," ignoraient sans doute ce rosier ?—1852. Kirschleger, "Flore d' Alsace," ne dit rien du *R. glauca*, Villars ; il semble ignorer ce qui a été publié 40 ans avant lui !—1853. Apparait dans la "Flore du Jura" de M. Godet, in *R. rubrifolia*, *β*. *Reuteri* ; qui n'est pas autre chose que la variété *pinnatifida*, Seringe in DC. Le besoin ne se faisait pourtant pas sentir de créer un nouveau nom pour une chose existante déjà depuis 1825 !—1861. Reuter, "Catal. de Genève" ; la variété établie par M. Godet, dans sa "Flore du Jura," p. 218, se change en espèce distincte dans le catalogue de Reuter et prend le nom de *R. Reuteri*, Godet.—1861. Nous même dans notre "Essai sur les rosiers," nous avons admis le *R. Reuteri* ; mais nous gardions un doute sur cette espèce de nouvelle création, qui nous semblait devoir être décrite depuis longtemps, à cause de son abondance dans la région montagnarde où elle végète ; il nous paraissait assez étrange que cette forme marquante n'ait pas attiré l'attention des anciens monographes. En 1853, herborisant dans les Vosges avec feu Billot, nous récoltâmes ce rosier qui fut placé dans notre herbier sous le nom de *R. vosagiaca*, Desp., détermination que notre savant maître M. Boreau, avait bien voulu nous communiquer en 1854.—1864. M. Grenier, qui dans sa "Flore de France," n'admet que 23 espèces de rosiers, va de l'avant pour sa flore jurassique, puisque pour le Jura seulement il donne l'énumération de 46 types dont six sont de sa création. Il admet sans rien consulter du passé le *R. Reuteri* comme une nouveauté pour la flore française, mais, hélas ! qui avait été décrite 52 ans avant lui !—1871. M. Arvet-Touvet, "Essai sur les plantes du Dauphiné," décrit comme espèce nouvelle sous le nom de *R. alpiphila*, le *R. vosagiaca*, Desportes, réédité en 1861, sous le nom de *R. Reuteri*.

R. glauca, *Desf.* (1808) = R. rubrifolia, *Vill.* (1789).
R. „ *Villars* (1809) = R. vosagiaca, *Desp.* (1828).
R. „ *Dierb.* (1818) = R. repens, *Scop.* (1772).

R. glauca *Schott.* (1822) = R. Schottiana, *Seringe*, (sub *R. canina*, var.) (1825).
R. Reuteri, *Godet* (1861) = R. vosagiaca, *Desp.* (1828).
R. alpiphila, *Arv.-Touv.* (1871) = R. ,,

ON THE FLORA OF THE LEEDS AND BRADFORD DISTRICT.

By F. Arnold Lees, F.L.S.

The substance of Dr. Willis's paper before the British Association, given in this Journal (pp. 10-18), suggests, and its many queries appear to invite, some remarks by way of amplification, if not of correction. A close and loving acquaintance for many years with the district in question, made with a view to a fuller Flora of the Riding than has yet appeared, perhaps entitles to the right of comment. I entirely concur in the bulk of the remarks in the paper—it is more with details than generalities that I am concerned here

The region included by Dr. Willis (for purposes of contrast with the limestones east and west, I suppose) as the environs of Bradford appears to be a somewhat large one, to judge from the internal evidence afforded, to one well acquainted with their stations, by many of the species given as found "on the grits and clays of the immediate neighbourhood of Bradford"; for the precise limits, by radius mileage or otherwise, of the district-circle are nowhere in the paper as published clearly defined. So large, indeed, that considering Leeds with Bradford (ten miles apart) to be about the centre of a tract excluding the limestones—as done in the title of this paper—cannot greatly affect the Flora, since it does not materially enlarge the district. In the following remarks, however, I shall confine myself strictly within the limit Dr. Willis appears to have intended; nevertheless I will define it, viz., northward from Bradford and Leeds to the gritstone spurs of the tableland on the far side of the Wharfe, from Harewood to Ilkley; north-west from Bradford up the Aire valley to Kildwick, and thence round by Haworth, Hebden Bridge, Huddersfield, and Methley to Harewood, completing the circle. This will include parts of three riversheds, the Colne and Calder, the Aire, and the Wharfe. The south-east quarter of this circle marks the coal country, the Flora of which will be considered separately; the northern half of the circle maps out the gritstone; the south-west quarter the flagstone stratum within our limits. For those who may wish to compare the plant-lists with the records in H. C. Watson's "Topographical Botany," I may say that the country to the south of the river Aire is within vice-county 63, South-West York, and that north of the same river in 64, Mid West York.

First, I note a list of species Dr. Willis does not know to occur "in this part of the country." Some of them, however, are not absent.—*Myosurus* the writer has once met with in a thin-cropped, sandy field where water had stood, at Thorner, near Leeds, bordering upon the eastern (magnesian) limestone. Mr J. G. Baker records localities, and accounts it native in North Yorkshire, and I think it should, therefore, so occur with us if well-searched for in the district of Lower Aire, towards Selby. *Malva rotundifolia* is indicated in two or three spots in the north-east of our district, but, as is usual with this species in the North of England, in lanes or hedge-banks near farm dwellings; at home now, but still with a suspicion of introduction originally, like *Chelidonium*, *Senecio sarracenicus*, and Wormwood. *Geranium pusillum* is, I believe, often overlooked—perhaps not known well by many local botanists. It occurs in the Wharfe valley, and on the Permian formation at Smeaton Crags, near Askerne, and elsewhere. [On the same tract I find it very commonly in Durham.] *Scleranthus* grows in sandy fields at Meanwood and Harewood, upon the gritstone, and is common east of the calcareous tract. *Ægopodium* occurs in plenty in many shady spots near our becksides, in coppices and rural lanes, with every appearance of a true wilding. I am inclined to regard it as a native with us. *Asperula cynanchica* grows at Thorp Arch, and in Wentvale, on magnesian limestone; the former station its northern limit on the east side of Britain. *Centaurea Cyanus* and *Helminthia* are not very common, still both occur not rarely; *Helminthia*, perhaps, most often on railway embankments. *Cuscuta Trifolii* casually at Bramhope on grit, Kippax on limestone, &c. *Echium vulgare* is plentiful upon the magnesian limestone, as at Brotherton and Knaresborough, and has occurred sporadically far off it. *Salvia verbenaca* is noticeable with the last at Knaresborough, and in the valley of the lower Wharfe. *Calamintha Acinos* is common enough at Pontefract, in old quarries and on calcareous pastures; and *C. officinalis* grows at Rigton sparingly, and farther north near Ripon. *Galeopsis Ladanum* I have seen but rarely within the district—Eccup, Milford. *Lysimachia Nummularia* is plentiful by drain and ditch sides, and in osier-beds by the Aire below Leeds, as at Brotherton, &c. *Ceratophyllum* in pools and mill-dams here and there, but not frequent—by the waterfall at Roundhay Park, near Leeds. *Spiranthes autumnalis* is with us thoroughly xerophilous, and quite confined to the eastern limestone—Barwick-in-Elmet, Bramham, Knaresborough. *Iris fœtidissima*, doubtfully wild, in a pond or two in the Wharfe and Ure valleys.

On the other hand, of those species named along with the above as not occurring, *Onobrychis*, *Erodium*, *Viburnum Lantana*, *Cichorium*, *Solanum nigrum*, *Orobanche*, and *Carpinus* are really absent, not only from the Bradford grit and clay, but from the limestones as well; and as I have stated in a former paper (vol. ii., N.S., p. 67) *Erodium*, *Cotyledon*, *Campanula Trachelium*, and *Euphorbia amygdaloides* are to be regarded as characteristic absentees, along with *Ranunculus hirsutus*, *Trifolium arvense*, *Geranium pyrenaicum*, and others.

To constitute a plant characteristic of a local tract, it should hardly occur commonly in the one contrasted with it. If I am right in this, *Pinguicula vulgaris* and *Kœleria* cannot be "characteristic of the Craven district," seeing that I have not found them to be either confined to the scar-limestone, or more abundant there than over large tracts off it. *Arabis hirsuta* even, which is most abundant in the western hilly region, occurs pretty frequently on the magnesian tract from Askerne northwards to Ripon; whilst *Kœleria* is plentiful on the same stratum at Brotherton, Micklefield, on the Knaresborough cliffs,

&c.; and *Pinguicula vulgaris*, again, is common and luxuriant upon the moors and bogs of the millstone grit, as on Rombald's Moor, Blackmoor, Adel Bog, and also on the mosses of the low country to the east.

For the rest, out of those species styled "distinctive of the Askerne district," *Hippuris*, *Humulus*, *Conium maculatum*, *Orchis Morio*, and *Colchicum* are *not* confined to that tract of country. *Hippuris* has been met with in the Aire and Wharfe valleys, and I have seen it very abundant in a watery bog high up on the plateau known as Hard-Flask, between Malham Tarn and Arncliffe, on the Craven limestone, at an altitude of near 1500 feet—the highest station I am acquainted with. *Humulus* trails over hedges at Leathley in Wharfedale on the grit, and at Mirfield on the flagstone. *Conium* is common enough in Wharfedale and Nidderdale, about Harewood and Plumpton *Orchis Morio* and *Colchicum* not specially on the limestone; fields full of them near Poole, &c., on millstone grit.

Lastly, *Galium verum* can hardly be classed amongst species distinguishing both limestones from the grit, since it grows (though of course neither so abundantly nor so universally) both in the Aire and Wharfe district on sandstone.

Eleocharis acicularis is mentioned by Dr. Willis as to be met with on the moors along with *Carex pulicaris*. With regard to the former species, is there not some inadvertent error? Without wishing to be too dogmatic, I would suggest that *Scirpus setaceus* was the species seen, inasmuch as it is rather common in such situations (though included within brackets in the list of Bradford plants as the rarer of the two), and both with us and in North Yorkshire ascends to over 1500 feet; whilst *E. acicularis* has not occurred at elevations much over 100 yards, but is, on the contrary, characteristically restricted to low grounds. On the sandy, marshy tracts near York (outside our limits) it is plentiful, though I am aware it has been reported just once from the grit-stone near Yeadon by Dr. Carrington—since unsuccessfully sought for there.

Gentiana Amarella I have found confined to the limestone, whilst *G. campestris* is pretty abundant upon high pastures not on limestone, as at Ovenden and Warley, near Halifax. *Galanthus* is certainly introduced in our woods *on sandstone*; and *Narcissus Pseudo-narcissus* oftener so than not, though in the valley of the Washburn—a tributary of the Wharfe—where it is very plentiful, it is undoubtedly indigenous.

From the streams and pools of the Bradford district *Lysimachia vulgaris* is not altogether absent. *Glyceria aquatica* hardly abounds—on the gritstone I have always found it to be rare; whilst *Littorella* has been detected in six or seven reservoirs at least, widely distributed. *Sanguisorba officinalis*, too, off damp limestone pastures and osier-beds is quite a rarity.

In conclusion, I give some additions to the appendices of Dr. Willis's paper, and some erasures which will require to be made.

I. Plants of the Grit and Clay District.

Note.—A after the name of a species denotes its occurrence in the

Aire rivershed; C in that of the Calder; W in that of the Wharfe. Doubtfully indigenous species are given in *italics*.

Species additional to those named by Dr. Willis.—*Clematis Vitalba* A W. Ranunculus circinatus W, Lenormandi A. Aquilegia A. *Actæa* C. Papaver dubium A C W. Chelidonium A W. *Armoracia rusticana* W. Nasturtium terrestre A C, sylvestre A W, amphibium A C. Reseda Luteola W. Sagina nodosa A W. Spergularia rubra A W. Radiola A. Hypericum Androsæmum A, elodes A. Geranium pusillum W, columbinum W. *Impatiens Noli-me-tangere* W. Ulex Gallii A W. *Melilotus arvensis* W. *Trifolium hybridum* A. Ornithopus A. Vicia hirsuta A C W. *Prunus Avium* A W. Comarum A W. Rubus suberectus A, Radula A W, dumetorum A W, cæsius A W. Rosa Sabini A, mollissima A W. *Pyrus communis* A. Epilobium roseum A, palustre A. Hippuris A. Ceratophyllum A C. Peplis Portula A. Scleranthus A W. Conium A W. Helosciadium inundatum A. Ægopodium A C W. Pimpinella magna W. Sium angustifolium W. Galium verum A W, Mollugo W. Valerianella dentata A C W. Helminthia A W. Hieracium boreale A C W. Carduus heterophyllus A. Centaurea Cyanus A W. Bidens cernua C. Artemisia vulgaris A W. Senecio erucifolius W, *sarracenicus* A. *Doronicum Pardalianches* W. Matricaria Chamomilla W. *Vinca minor* A. Gentiana campestris C. Menyanthes A W. *Cuscuta Trifolii* W. *Verbascum Thapsus* W. Pedicularis palustris A. Linaria minor A W. Limosella aquatica A. Mentha sativa A W. Galeopsis Ladanum W, versicolor A. Scutellaria minor A. Myosotis repens A. Lysimachia vulgaris W, Nummularia A. Chenopodium rubrum A W. Rumex nemorosus A W, obtusifolius A C. Polygonum Hydropiper A, mite A. *Humulus* C W. Salix [undulata W], *Smithiana* W, aurita A W. Listera cordata C W. Epipactis latifolia W. Orchis Morio W, latifolia W. Colchicum W. Carex dioica A, intermedia A, muricata A W, binervis A W, lævigata A, pilulifera A W, ampullacea A, vesicaria A, paludosa, A W. Festuca sciuroides A. Nitella flexilis A W.

Species queried or italicised by Dr. Willis which do occur.—Thalictrum flexuosum W. Parnassia A W. Rosa tomentosa A W. Chærophyllum temulum A W. Galium palustre A. Tanacetum A W. Rumex sanguineus A. Betula glutinosa A. Salix aurita A W. Juncus glaucus A. Aira caryophyllea A W. Serrafalcus commutatus A W, racemosus A. *Lolium italicum* A. Equisetum palustre A W.

Species requiring erasure, as very doubtful.—*Eranthis* and *Pulmonaria*, without any claim to inclusion even as denizens. *Vicia tetrasperma*, very rarely if ever, and depauperate *hirsuta* common! *Anthyllis*, *Poterium*, *Galium boreale*, *Myosotis collina*, *Melampyrum sylvaticum*, *Ballota fœtida*, *Carex pendula*, *divulsa*, all occur *on* the calcareous tracts, but nowhere off them, I think. *Sedum acre*, only where planted. *Sempervivum*, ditto. *Senecio viscosus*, perhaps on railway bank ballast, but nowhere else. *Artemisia campestris*, queried as though possible, but of course a mere *lapsus calami* for *vulgaris!* *Pyrola media*, recently by any good observer? *Parietaria erecta* (Koch), *Festuca rubra*, *Equisetum variegatum*, no records, but hardly likely?

II. PLANTS ABSENT FROM THE BRADFORD FLORA WHICH OCCUR ON THE LIMESTONE TO THE EAST OR WEST.

NOTE.—Species found on the Western Scar-limestone are indicated by W; those of the Eastern Permian tract by E. Doubtfully indigenous plants in *italics*. Species not seen by the writer are placed within brackets.

Additional Species.—Myosurus E. Helleborus viridis E W, *fœtidus* E W. Papaver hybridum E. *Meconopsis* W. Thlaspi arvense E, occitanum W. Lepidium Smithii E, *Draba* E. Draba incana W. Teesdalia E. Cardamine impatiens W. Diplotaxis tenuifolia E. *Reseda alba* E. [Helianthemum canum W.] Viola hirta E. Silene maritima W, noctiflora E. Stellaria glauca E. Cerastium aquaticum E. *Malva rotundifolia* E. Geranium sanguineum E. Ononis spinosa E. *Melilotus vulgaris* E. Astragalus glycyphyllos E Spiræa Filipendula E. Potentilla verna E. Rosa micrantha E, *rubiginosa* E W. Pyrus Aria W. Hippuris W. Sedum acre W, *sexangulare* W? [Petroselinum segetum E.] Sison E. Bupleurum rotundifolium E. Œnanthe Lachenalii E. Galium montanum W. Asperula Cynanchica E. Picris E. Lactuca virosa E. Serratula E. Carduus crispus E. Pyrola rotundifolia E, minor W. Ligustrum W. Gentiana Amarella E W. *Verbascum Blattaria* E. Veronica Anagallis E W. Melampyrum sylvaticum W. *Mimulus luteus* E W. Verbena E. Mentha viridis W. Origanum E. Calamintha officinalis E. Lithospermum officinale E. Echium E. Plantago media E W. *Daphne Mezereum* W. Cephalanthera ensifolia W. Habenaria chlorantha W. Galanthus E. *Tulipa* E. Allium oleraceum W, Scorodoprasum W, vineale E. Polygonatum officinale W. Cladium E. Schœnus W. Blysmus compressus W. Scirpus fluitans E. Carex divulsa E, digitata E, pendula E. Arundo Epigejos E. Avena pubescens E, pratensis W. Kœleria E W. Melica nutans E. Catabrosa E. Brachypodium pinnatum E. Hordeum sylvaticum E. Lycopodium alpinum W (but on the gritstone caps of the hills).

Erasures as possible errors—at any rate further proof desirable.—*Diplotaxis muralis*. *Sedum anglicum*, ? planted. *Polystichum Lonchitis*, extinct. *Sedum reflexum* and *album* most certainly only where planted.

SUMMARY.

The 70 additions made to the species found on the grits and clays of the Bradford district (minus 8 rejected) raise their number to 525; with 63 additions (minus 5 exclusions) to Dr. Willis's list of 144 plants restricted to the limestone regions, we have an aggregate of 727 species which can with certainty be claimed for Central West Yorkshire, and of these 202 are only found on one or both of the calcareous tracts. The deficiencies of the true xerophilous class of species over our limestone regions, when their northerly position is considered, may thus be inferred to be not very numerous, several of those we do possess just reaching and finding their northern limit with us. Adding to these 230 others which find a suitable home only on alluvial and other ground still farther east or west of the limestones, we arrive at a total of 957 species (excluding pure aliens), the number found, so far as at present known, in the entire West Riding of Yorkshire, this being 35 less than the number claimed for North Yorkshire by Mr.

J. G. Baker in his Flora of that division of the county—a fact contrary, perhaps, to what one would expect of a more southerly district, but explainable in part by the greater altitude of the western hills, and much greater diversity of surface and of strata east of the central valley, together with the possession of a varied coast-line. Seventy-five species occur in North Yorkshire which are unknown in the West Riding, whilst this vice-county can claim only forty not indicated for the other as well; but a mention of these, as of certain hitherto unrecorded species from stations outside the limits dealt with in this paper, must be reserved for future notes on West-Riding Botany.

SHORT NOTES AND QUERIES.

Flora of Sark.—I send you the following additions to the list printed in the "Journal of Botany" for July, 1872:—

Ranunculus floribundus, *Bab.*
„ parviflorus, *L.*
Fumaria muralis, *Sonder.*
Dianthus Armeria, *L.*
Stellaria graminea, *L.*
Alchemilla arvensis, *Scop.*
Epilobium hirsutum, *L.*
Callitriche platycarpa, *Kutz.*
Peplis Portula, *L.*
Chenopodium rubrum, *L.*
Rumex nemorosus viridis, *Sibth.*
„ „ sanguineus, *L.*
Lemna minor, *L.*
Arum maculatum, *L.*
Scirpus palustris, *L.*
Carex præcox, *Jacq.*
Poa trivialis, *L.*
Lolium temulentum, *L.*
Polystichum angulare, *Newm.*
Lastrea Filix-mas, *Presl.*
„ dilatata, *Presl.*
Osmunda regalis, *L.*
Equisetum sylvaticum, *L.*

Stellaria graminea and *Rumex nemorosus sanguineus* are added on the authority of the Rev. J. J. Muir. From what I observe of the latter plant here, it appears to pass into the form *viridis* in various stages of its growth. *Anthriscus vulgaris*, Pers., got into my former list by mistake. It may very probably occur in Sark; but I have not seen it there.—Martin M. Bull.

Rate of Growth of the Adansonia in India.—The following are measurements of a tree in a garden at Alipore (Calcutta), Dec. 3, 1873:—Girt at base, 49 ft. 6 in.; girt 4 ft. up. 46 ft. 6 in.; girt above lower branch, 38 ft.; girt of lowest branch at base, 22 ft.; height above, 80 ft. Mr. Grote, in whose garden the tree grew, measured it March 23rd, 1850. Girt 1 ft. from the ground, 42 ft.; girt about 6 ft. up the stem, 38 ft. The base measurement gives an increase of 7 ft. in the twenty-three years.

Extracts and Abstracts.

ON THE WORLD-DISTRIBUTION OF BRITISH PLANTS.

By Thomas Comber.

[*Abstract of a Paper printed in the Transactions of the Historic Society of Lancashire and Cheshire*, 1874.]

As regards their occurrence within Britain, Mr. Watson has proposed for British plants certain groups, which he terms *types of distribution;* such as *British* for those plants which are met with pretty generally all over Great Britain; *Scottish* and *English* for those which are found only or mostly in the Northern or Southern half of the island; *German* and *Atlantic* for those which are confined chiefly to the South-eastern or South-western provinces. But, although from the names of the two last it might be inferred that the range outside of the United Kingdom is indicated, Mr. Watson is careful to state that his types are "to be understood in reference only to their distribution within Britain itself and by itself." So far as I am aware no attempt has yet been made to arrange our plants into groups according to the general geographical area they occupy outside of the United Kingdom. It was at first intended to omit plants known or suspected to be only naturalised in Britain, or whose foreign area is uncertain owing to their being extensively naturalised in other countries; but as this would exclude many species whose presence with us is of great interest, it was ultimately decided to include all aggregate species admitted into the sixth edition of the London Catalogue, except a few the area of which, from confused nomenclature or other causes, has not been satisfactorily determined.

According to latitude and elevation four ZONES may be recognised, viz.:—I. *Southern:* Comprising plants which belong chiefly to the latitude of the Mediterranean; and, although they extend as far as Britain, are not found North of the parallel of 60°; nor with us at a higher elevation than Mr. Watson's Agrarian region. II. *Temperate:* Containing plants which, while generally extending South to the Mediterranean, range over the whole of Europe, except frequently the extreme North; and also some plants of more limited range, which extend neither far North nor far South. III. *Northern:* Consisting of species of Northern and Central Europe, which, although descending with us into the Agrarian region, if they reach Southern Europe are then found only at a considerable elevation. IV. *Arctic:* Including plants of the extreme North, which do not descend to the sea-level in any part of Britain; and also those which extend farther south, but are there strictly Alpine plants.

Viewed as to their range from East to West, our Flora falls likewise into four main divisions, extending as follows:—*Division* I. To *Europe* only: not spreading farther East than the Ural Mountains and the Caucasus, nor extending to any part of Asia. *Division* II.

To *Europe* and *Asia*: ranging more or less into the latter continent, and sometimes stretching quite across to its Eastern shores. None of the species in these two first divisions are met with in America, except as introduced plants or emigrants; but some of them extend Westwards to the islands of the Atlantic; the Southern species to the Azores, Madeira, and the Canaries; the Northern chiefly to the Faroe Islands and Iceland; and they thus form an intermediate step towards the next two divisions, the plants contained in which are found in the New World as well. Some of these are also to a certain degree intermediate, being found in America only in Greenland, whose Flora is semi-European in type. Others seem to have spread into America from Asia rather than from Europe, being recorded only West of the Rocky Mountains; and a few occur only in the Aleutian Islands, which occupy the same intermediate position on the Pacific that Iceland and Greenland do on the Atlantic side. *Division* III. contains the comparatively small number of species that are confined to *Europe* and *America*, but have not yet been found in Asia; while *Division* IV., which, for want of a better term, may be called *Universal*, comprises plants which spread into all the three continents of the Northern Hemisphere. Most of them do not extend into or across the Tropics; but there are a number which more properly deserve to be called "Universal," for they are met with in the Southern Hemisphere; and some are true cosmopolitans, being found almost all over the globe, and apparently equally at home everywhere.

Combining these four divisions with the four zones previously described, we have sixteen primary *groups*, some of which contain only a small, others a very large, number of species. These latter may conveniently be divided into *sections*, according as plants composing them occupy partially or wholly the area of the groups.

Group I. *Southern Europe.*—This group comprises 223 species, which mostly belong to the Mediterranean district, and are generally more abundant there than with us. Many of them (87, or 39 per cent.) are recorded from the North of Africa; and a smaller proportion (53, or 24 per cent.) have been found in the Azores, Madeira, or the Canaries; 77 (or 35 per cent.) are colonists, or otherwise naturalised. I propose to arrange them into four sections.

Section 1. Twenty species which are found in the Spanish Peninsula, and thence range Northwards to the British Islands.

Section 2. Eighteen species which do not extend Eastward along the Mediterranean beyond Italy, and in crossing Europe are not found East of Germany proper.

Section 3. Sixty-four species which either range along the Mediterranean beyond Italy, or in passing North stretch into Austria, but are not found in Russia.

Section 4. One hundred and twenty-one species which pass the frontiers of Russia Eastward.

Group II. *Temperate Europe.*—This is smaller than the preceding group, and contains only 73 species, of which 8 (or 11 per cent.) have been recorded from the Southern Isles of the Atlantic; and 15 (or 20 per cent.) from the Faroes or Iceland, termed hereafter the Northern Isles; 15 (or 20 per cent.) reach North Africa; while only 7 penetrate within the Arctic Circle. Being only a small group it is not divided into sections.

GROUP III. *Northern Europe.*—This consists of 15 species, of which a considerable proportion belong to the genus *Hieracium*. Two are recorded from the Northern Isles; 5 from within the Arctic Circle.

GROUP IV. *Arctic Europe.*—Arctic plants generally range so freely East and West that only 5 of our British species can be recognised as confined to Europe alone; and of these, 1, the Cyphel (*Cherleria sedoides*), is common to our own mountains and the high ranges of Southern Europe, but does not occur Northwards.

Returning now to the Southern Zone, we come to

GROUP V. *Southern Europe and Asia*, which, like Group I., consists mostly of plants belonging to the Mediterranean district, but differs in their extending more or less into Asia: 224 species come into it, of which more than half (131, or 58 per cent.) have been recorded from North Africa; and 77 (or 34 per cent.) from the Southern Isles. In this group will be found a great number of our colonists or introduced cornfield weeds. According to the range Eastward into Asia, the group can be divided into three sections, as follows:—

Section. 1. One hundred and forty-seven species which have been recorded from Western Asia or Siberia, but which do not occur in India, nor farther East.

Section 2. Fifty-six plants which stretch as far as India, but have not been met with in Eastern Asia.

Section 3. Contains 21 species which extend to Eastern Asia.

GROUP VI. *Temperate Europe and Asia.*—This is the largest of our proposed groups, and contains 379 species. About a fourth of these (101, or 27 per cent.) extend North beyond the Arctic Circle, and in that respect might be classed as Northern plants; but they are also found in Southern Europe, and many of them are recorded from Algeria. Altogether rather more than half the group (194, or 51 per cent.) have been met with in North Africa; 96 or (25 per cent.) in the Southern Isles; and 83 (or 22 per cent.) in the Northern Isles. The species are divided into three sections, on the same grounds as the last group—that is, according to their range Eastward into Asia.

Section 1. Contains 165 species that do not range beyond West Asia and Siberia.

Section 2. Eighty-nine species which are found in the Himalaya, but do not reach Eastern Asia.

Section 3. One hundred and twenty-five species recorded from Eastern Asia.

GROUP VII. *Northern Europe and Asia.*—This embraces only 14 species, nearly all penetrating within the Arctic Circle, and 7 of them recorded from Iceland.

GROUP VIII. *Arctic Europe and Asia.*—Even smaller than the last group, for only 3 species can be placed in it, of which one, the Spring Gentian (*Gentiana verna*), is an Alpine plant, ranging altogether Southwards from Britain, unless a doubtful report of it from Iceland prove correct.

With this group we end the plants that are restricted to the Old

World, and enter, in the next division, upon those that are not found in Asia. They are very few in number, being limited to only 42 species; but, few as they are, they would be further diminished if naturalised plants were excluded. Eight of them are American plants which have escaped from cultivation, and by this means become naturalised with us; 3 others are also American plants believed to have been introduced by human agency. Deducting these 11 naturalised species, there are left only 31 as native with us, out of which 5 are European plants, found in America in Greenland only.

GROUP IX. *Southern Europe and America.*—This contains 9 species, of which 3 have been met with in North Africa and 2 in the Southern Isles.

GROUP X. *Temperate Europe and America.*—Twenty species, 6 of which are found in the Arctic regions; 4 in the Northern Isles; 2 in the Azores; and 5 in Africa.

GROUP XI. *Northern Europe and America.*—Of the 5 species under this group, 3 have American stations only in Greenland.

GROUP XII. *Arctic Europe and America.*—This contains 8 species, all rare with us, being mostly confined to the Scotch mountains; 6 are found in Iceland; and 2 extend on the other side of the Atlantic to Greenland only.

GROUP XIII. *Southern Universal.*—Contains only 23 species. A few only are confined to North Temperate regions; the great majority extend into the Tropics, and some seem to grow more plentifully and luxuriantly there; more than half extend into the Southern Hemisphere; and several have there a wider range than in Northern latitudes. But for its small number this group might, therefore, be divided into sections corresponding to those proposed for the following one.

GROUP XIV. *Temperate Universal.*—Contains in all 289 species, of which just two-thirds, 192, have been recorded from the Arctic regions; 97 from Greenland; 156 from the Northern, and 102 from the Southern, Isles. Altogether 191 (or 66 per cent.) occur in one or more of these intermediate stations; and 135 (or 47 per cent.) extend to North Africa. A number of the plants are as common in America as with us; but generally the species of this group are more frequent in the Old World, and a few are found only in isolated stations in America. Some few widespread weeds are included in the group—not in the belief that they are really native over so wide a range, but from the sheer impossibility of deciding, with any degree of certainty, where they are indigenous and where not. The plants contained in the group vary so greatly as to their extent of distribution that it seems necessary to divide them into 8 sections, of which the first 4, containing 194 species, are confined to the Northern Hemisphere; the last 4, containing 95 species, extend more or less South of the Equator.

Section 1. Twelve species found on the other side of the Atlantic in Greenland only.

Section 2. Fifty-five species which occur only East of the Rocky Mountains.

Section 3. Sixteen species which, on the other hand, are recorded only from Western America.

Section 4. One hundred and eleven species recorded from both East and West America.

The next three sections include species which are found in only one of the three Continents of the Southern Hemisphere.

Section 5. Sixteen species in South America only.

Section 6. Ten species in South Africa.

Section 7. Thirteen species in Australia or New Zealand.

Section 8. In this last section are enumerated 56 species which are more widely distributed in the South Temperate regions, and are found there in more than one Continent, some in all three. Amongst these wide rangers, it will be found that there are are a proportionately large number of aquatic plants and of ferns.

GROUP XV. *Northern Universal.*—Contains 94 species, of which 84 stretch beyond the Arctic Circle, 58 have been met with in Greenland, and 67 in the Northern Isles. Altogether, 74 (or 79 per cent.) occur in one or both of these intermediate stations.

GROUP XVI. *Arctic Universal.*—Of the 53 species which constitute this group, 4 have American stations only in Greenland. Nearly all, 45, have been reported thence, and 42 from Iceland.

This concludes the details of the proposed arrangement. The following tables show at a glance the results arrived at. They give the number of species included in each group, the total of each zone and division, and its percentage of the whole number of species enumerated—the first table including, and the second omitting, naturalised species.

TABLE I.

	Europe.	Europe and Asia.	Europe and America.	Universal.	Total.	Per Cent.
Southern . .	223	224	9	23	479	33
Temperate . .	73	379	20	289	761	53
Northern . .	15	14	5	94	128	9
Arctic . . .	5	3	8	53	69	5
Total . .	316	620	42	459	1437	100
Per Cent.	22	43	3	32	100	

TABLE II.

	Europe.	Europe and Asia.	Europe and America.	Universal.	Total.	Per Cent.
Southern . .	149	123	6	16	294	26
Temperate . .	61	299	12	264	636	57
Northern . .	12	13	5	94	124	11
Arctic . . .	5	3	8	53	69	6
Total . .	227	438	31	427	1123	100
Per Cent.	20	39	3	38	100	

Notices of Books.

The Desmidieæ of Norway. Bidrag till Kännedomen om Sydligare Norges Desmidiéer. [A Contribution to the Knowledge of the Desmidieæ of Southern Norway.] By O. Nordstedt. Lunds Universitets Årsskrift, tom. ix., 1872, published September, 1873.

The present occasion is the first of late years that the *Desmidieæ* of Norway have been made the subject of research. In the older authors, so far as known to Nordstedt, not one Norwegian locality has been recorded for any of these plants. In Rabenhorst's "Flora Europæa Algarum Aquæ dulcis et submarinæ" (1868) there are only three species specially recorded as occurring in Norway, and Wittrock in his "Anteckningar om Skandinaviens Desmidiacéer" (1869) enumerates twenty-seven species from two localities in the South-east and South-west of Norway. The researches made by Nordstedt in 1868 and 1872 were in the neighbourhood of Bergen and Kristiansand; as he remained but a limited time at each place, however, it is evident, he observes, that the localities visited are far from being fully examined. He states that the year 1868 was not favourable for such researches, as the summer was unusually dry. As in other places so in Norway, Sphagnum pools are the best localities. In one place near Kristiansand, as an example of the richness in species, he met with on a single visit no less than ninety-four forms in one and the same water. Even in the alpine regions a half-hundred species might be found almost directly up to the snow and ice. He had even seen that some could be without injury frozen up in the ice, and on its thawing, continue to live uninjured. There are some species, indeed, which seem mainly to occur in the neighbourhood of snow or ice; and they are met with above the region of trees, at an elevation of 3-5000 feet, or lower down near the glaciers. These species are: *Cosmarium monochondrum*, n.s., *C. hexalobum*, *C. crenatum*, *C. costatum*, *C. cyclicum*, *C. arcticum*, and *Staurastrum acarides*; as well as the following, which, indeed, but more rarely, are met with in other localities: *Cosmarium speciosum*, *C. tetragonum* (form), *C. holmiense*, *C. anceps*, *C. nasutum*, *C. cælatum*, and *Staurastrum amænum* (form). All these species, except the new ones, occur indeed either in Spitzbergen or Greenland.

Amongst certain of the more general species which the author did not meet with there are to be particularly remarked *Staurastrum muticum*, *Pleurotænium nodulosum*, and *Sphærozosma vertebratum*. The two last of these, however, were found in Norway by Wittrock.

The species collected by the author in Norway amount to 261; adding Wittrock's two the number reaches 263. This number will, of course, be much increased by future researches, as these plants have in general a wide distribution, and at present over 400 species are known as European. There are 330 species known to occur in Sweden, and without the ten new species there are only twenty-two occurring in Norway but not recorded for Sweden. The number of species common to Norway and Sweden thus reaches 229, and in both countries together there are found 362 species.—Amongst the more noteworthy forms should be mentioned a triangular form of *Cosmarium Meneghinii*, var. (*C. crenulatum* De Not.); also *Hyalotheca dissiliens*, β. *bidentula*, and γ. *tridentula*. These two last-named, as regards the figure of the cells, form a transition to the genus *Desmidium*, especially the peculiar species *D. cylindricum*. Of most of the *Euastrum* species a scrobiculate form was encountered. In the enumeration of the species the author follows the plan of Lundell's Work, "De Desmidiaceis, quæ in Suecia inventæ sunt, observationes criticæ" (in Nov. Act. reg. Soc Sci. Upsal., ser. 3., vol. viii., fasc. 1, 1871). He does not, therefore, quote synonymy largely, except where he differs from that author. The special localities where he met with the species are indicated.

The *new* forms are:—*Euastrum sublobatum* (Bréb.), n. var. *crispulum* [this appears indeed a *distinct* form]; *Cosmarium quadrum*, Lundell, β. *minus*, n.v. [described as one-half smaller than Lundell's form and closely resembling *C. Broomei*; query, *is* it that species? It has smooth zygospores]; *Cosmarium isthmochondrum*, n.s. [a medium-sized, seemingly well-marked species, resembling at first glance *C. quinarium*, Lundell, its chief noteworthy characteristics, amongst others, being one or two central scrobiculi, and upon the isthmus a couple of prominent papillæ]; *Cosmarium monomazum*, Lund., β. *polymazum*, n.v. [distinguished from Lundell's form by possessing three (not one only) emarginate tubercles on each front of each segment, and like the preceding form furnished with a couple of papillæ on the isthmus on each surface]; *Cosmarium hexastichum*, Lund., β. *octastichum*, n.v. [differs from Lundell's form in having eight in place of six marginal series of emarginate verrucæ]; *Cosmarium pseudonitidulum*, n.s. [medium-sized, about one-fourth longer than broad; constriction deep, linear; segments subtrapezoid, lower angles broadly-rounded, whence the sides narrow to the broadly rotundato-truncate upper margin; membrane punctate; amylaceous granules double; segments in end-view elliptic, in side-view ovato-circular. Resembles *C. nitidulum*, De Not., but differs in its *double* amylaceous granules, and the linear constriction. The author points out distinctions between this and *C. tumidum*, Lundell, *C. pachydermum*, Lundell, *C. cruciatum*, Bréb., and *C. galeritum*, Nordst., all of which seem sufficiently obvious]; *Cosmarium monochondrum*, n.s. [very minute, about as long as broad, constriction wide, subrectangular; segments elliptico-cuneiform, angles somewhat produced and rounded, upper margins broadly convex, with a central papilla; membrane smooth; in end-view narrow-rhomboid, papillate at each side, in side-view circular, papillate at each side]; *C. phaseolus*, Bréb., β. *elevatum*, n.v. [segments here hexagono-elliptic, upper margin truncato-convex, on centre of each front surface a prominent papilla. This form thus differs from *C. phaseolus*, Bréb., by the segments not being reniform; their outline resembles that of *C. monomazum*, Lund., but that species possesses marginal series of granules]; *Cosmarium pachydermum*, Lundell, β. *minus*, n.v. [although this form differs not inconsiderably in size and even in habit from Lundell's species, still the author thinks it ought to be referred thereto as a variety. In Swedish examples of the normal size he has seen some in which the lower angles of the segments were more rectangular (though still rounded off), causing the constriction to become expanded only towards the outer portion, and the segments were at same time somewhat truncate, as in the n.v.]; *Cosmarium mamilliferum*, Nordst., *β amaxum*, n.v. [one-third smaller than *C. mamilliferum*, without granules; notwithstanding the absence of the two papillæ, in place of which is found a slight elevation on each surface, the author holds that he must place this as a variety of the species indicated. It approaches *C. biremum*, *Meneghinii*, *concinnum*, *angulosum*, and *exiguum*; from the last-named it is distinguished by its deep constriction and its shortness]; *Cosmarium obliquum* [minute, variable in size, about one-third longer than broad, rectangular; constriction a shallow notch; segments subquadrate, angles rounded, sides and upper margins concave; membrane minutely punctate; amylaceous granules single; segments in end-view almost *semicircular*. Resembles much *C. laticeps*, Grunow, but distinguished by the *obliquity* of the latter, a speciality the author finds constant in both Norwegian and Swedish examples]; *Staurastrum orbiculare* (Ehr.), Ralfs, *β. extensum*, n.v. [distinguished by its length being one-third greater than its breadth; resembles *C. cosmarioides*, Nordstedt, Desm. Bras., Videnskabelige Meddelelser fra den naturhist. Forening i Kjöbenhavn, (1869) p. 195, t. iv., f. 43]; *Staurastrum inconspicuum*, n.s. [very minute, about as long as broad; constriction a broad, rounded sinus; segments quadrate, upper angles produced into a long process, each obliquely directed upwards and at about half its length suddenly narrowed, presenting a knobbed-like appearance at that point, the upper portion still more obliquely directed upwards, end truncate; upper margins truncate; end-view 4-radiate, sides concave. A most marked little species, readily overlooked on account of its minute size, and occurs in a few localities in South and West of Ireland; it is identical with the form mentioned in Quart. Journ. Micr. Science, vol. x., n.s., p.89. One scarcely ever sees examples showing the processes alike in size on opposite segments, and in end-view they nearly always alternate with each other; the author appears to have found a form with six rays in end-view]; *Staurastrum geminatum* [medium-sized, about as long as broad; constriction deep, rapidly expanding; segments subelliptic, angles truncated, furnished with a pair of divergent, slender, bluntly-pointed spines, and two similar pairs on the sides between the angles; end-view triangular, sides concave, angles rounded, showing the pairs of spines thereat, those on the sides more or less superimposed. Resembles *S. hystrix*, but the segments are not quadratic, and the spines are thus in a double or geminate series]; *S. monticulosum*, Bréb., *β. bifarium*, n.v. [closely approaching *S. senarium*]; *S. Sebaldi*, Reinsch, *β. ornatum*, n.v. (a large and very fine form, occurring in several situations, very scantily, in Ireland, it resembles *S. Sebaldi* more than any other form, but still appears quite distinct; a series of short triparted spines bordering the upper margins of the segments, and carried onwards a good way along the elongate arms, seems characteristic, and, to judge from Reinsch's figure, to be quite distinct from the subulate scattered spines on the upper outer surface of his species]; *S. terebrans*, n.s. [a most marked species, very rare in Ireland, occurring very scantily in Co.

Cork, though less scarce in Connemara, and is identical with *S. elongatum*, Barker. See Quarterly Journal of Micr. Science, vol. ix. n.s., p. 424]; *S. paradoxum*, *β. longipes*, n.v. [also a form very local in Ireland, occurring in Connemara, and is one which appears to be distinct; it is far more slender and spreading than *S. paradoxum*]; *S. arcuatum*, n.s. [rather small, about one-third broader than long; constriction deep, expanding; segments elliptic, divergent (obversely lunate), angles furnished with short geminate divergent spines, on the upper surface at each side a pair of intermediate, short, bifid spines; surface granulate, granules in transverse lines; end-view triradiate, sides concave. The author (almost unnecessarily) contrasts this with *S. pseudofurcigerum*, from which it seems to be quite distinct. It occurs rarely in Ireland; in MSS. we had given it the same name]; *Xanthidium antilopæum*, (Bréb.), Kütz., *γ. dimazum* et *S. polymazum*, n.vv. [two interesting forms, the former characterised by *two* tubercles on each front surface a little above the middle, the latter by a semicircular series of about 10-12 minute papillæ occupying a similar position]; *Penium minutissimum*, n.s. [a minute subelliptic unconstricted form, about a half longer than broad, a smooth yellowish-coloured membrane, a thick-walled subquadrate zygospore. The author had not seen living examples]; *Hyalotheca dissiliens*, Bréb., *β. bidentula* et *γ. tridentula*, n.vv. [two interesting forms offering minute specialities; the former circular in end-view and showing a minute papilla on each side, the latter circulari-triangular in end-view and showing three equidistant blunt papillæ. These forms seem to point, as it were, to a transition to the genus *Didymoprium*. Judging, too, from specimens in spirit, the author not having studied them in the living state, the arrangement of the chlorophyll-contents, as well as the twisted arrangement of the joints, seem also to point in the direction of a union of these two genera]; *Desmidium* (*Didymoprium*) *quadratum*, n.s. [a very pretty, more slender form than *D. cylindricum*, Grev. (*Didymoprium Grevillii*, Kütz.), marked by the equal length and breadth of the joints in the broad view, the breadth being about one-third greater than the length in the narrow view]. The author did not study living examples, but only such as were put up in spirit, hence he is unacquainted with the arrangement of the chlorophyll-contents. A form coming close hereto, but seemingly still more pronouncedly distinct from *D. Grevillii*, is found, extremely rarely, in the West of Ireland. We have, too, been unable to obtain quite fresh chlorophyll-containing examples. Our form shows the lateral, tooth-like projections considerably more prominent and divergent than that of Nordstedt.]

Among the more noteworthy forms *not new* occurring to the author in Norway are *Micrasterias denticulata*, Bréb., with basal and middle lobes thrice divided; *M. Thomasiana*, Arch.; *M. conferta*, Lundell [not found in Britain]; *M. mucronata*, Dixon. The large *Euastra* were represented by examples with one or several central scrobiculi [quere, if these are not to be found in all examples (*E. oblongum*, *crassum*, *affine*, *ampullaceum*, and others) as characters of the species, though we have not seen a scrobiculate *E. ansatum*?]. *Cosmarium margaritiferum* [both forms referred to here, which are very distinct, are common in Britain. "Forma genuina" of Nordstedt might possibly be better denominated *Cosmarium reniforme* (Ag.)—segments reniform, in end-view equally elliptic, zygospores with long spines cleft at summit—and *Cosmarium margaritiferum* (Turp.)—segments semiorbicular, upper margins somewhat truncate, in end-view elliptic, somewhat prominent at the middle at each side, the central pearly granule being the largest, zygospores covered by not very numerous, rather large, and pellucid hemispherical tubercles]; *Cosmarium quinarium*, Lundell [occurs in Ireland, very rare]; *C. quadrifarium*, Lund., *C. hexastichum*, Lund. [both occur in Ireland, very rarely]; *C. speciosum*, Lund. [in Ireland, extremely rare]; *C. calcareum*, Wittrock [in Ireland, rare]; *C. Nymannianum* [in Ireland]; *C. pseudopyramidatum*, *C. variolatum*, Lundell, *C. gotlandicum*, Wittr. [all found in Ireland, but rare]; *C. Meneghinii* [several different forms of close affinity, in Norway, as elsewhere found]; *C. pseudoconnatum*, Nordst. [rare in Ireland, seems to be rightly referred to Lundell's subgenus *Pleurotæniopsis*]; *Arthrodesmus convergens*, Ehr. [a spineless form occurred to the author, found also in Ireland, and is doubtless the same thing as *Cosmarium depressum*, Nag., as the author mentions]; *Staurastrum aversum*, Lundell [occurs in Ireland, rarely, and appears doubtless a good species]; *Staurastrum O'Mearii*, Arch. [the author thinks this to be a *triangular* form of *Arthrodesmus Incus*, *β. intermedius*, Wittrock. In this he has but anticipated our own view, that Wittrock's is a compressed or plane form of *S. O'Mearii*, Arch., and not seemingly a variety of *A. Incus* at all. All these occur in Ireland. Several typically tri- or multi- angular species of *Staurastrum* of different types are known to possess their two-angled or two-rayed form]; *Staurastrum læve*, Ralfs, and *S. læve*, *β. Clevei*, Wittr. [both these pretty forms occur very rarely Ireland; the latter is an especially elegant form, and one extremely hard to be believed to be but a mere varietal form of the former. Of the latter species the author finds in Norway a form *supernumeraria*—that is, possessing on the upper surface 1-3 short, truncate, minutely cleft processes]; *S. Meriani*, Reinsch [a form very rarely met in Ireland]; *S. teliferum*, Ralfs [the author finds a form which he regards as a transition form to *S. polytrichum*, Perty. We have been inclined to suppose *S. Pringsheimii*, Reinsch, as equivalent to *S. polytrichum*, Perty; at any rate a form referable to Reinsch's occurs scantily in Ireland, a much larger and quite distinct thing from *S. teliferum*, Ralfs, the latter a quite common species]; *S. hystrix*, Ralfs [very uncommon in Ireland]; *S. oligacanthum*, Bréb. in litt. [a form extremely well-marked, and not uncommon in Ireland]; *S. pseudocrenatum*, Lund. [the author is quite right in his supposition that this is perfectly identical with *S. Maamense*, Archer, a form scantily met with in the South and West of Ireland, also at Ambleside, in Westmoreland, and a very well-marked and constant species]; *S. furcatum* (Ehr.), Bréb. [the author met with an example one segment with the character of *S. furcatum*, the other with that of *S. Senarium* (Ehr.). This is probably not surprising; those two forms seem to bear a relation to one another comparable to that of *S. furcigerum*, Bréb., to *S. pseudofurcigerum*, Reinsch; examples indeed occur in one and the same gathering, with and without the accessory processes—nay, this contrast may be sometimes seen in the opposite segments of one and the same individual]; *Staurastrum gracile*, Ralfs [the author meets with a two-rayed form—*β. bicorne*, Bulnheim—which occurs as yet in

Ireland only in two localities, and that scantily—Co. Westmeath and Co. Galway]; *S. tetracerum* (Kütz.) [the author meets 3-4 rayed forms he thinks referable to this species—doubtless correctly; in Ireland such occur, though more rarely than the Kützingian and Ralfsian form, which is very frequent]; *S. cerastes*, Lundell [a beautiful and graceful form, occurring extremely rarely in Ireland, and the same as that mentioned in Quart. Journ. of Micr. Science, vol. xii. n.s., p. 202]; *S. Ophiura*, Lundell [a very handsome form, met with at Ambleside, Westmoreland, but not as yet occurring in Ireland; it is not, as Nordstedt suggests, the same as *S. verticillatum*, Arch.]; *S. arctiscon* (Ehr.), Lundell, and *S. sexangulare* (Bulnheim), Lundell [both extremely rare in Ireland, and very fine forms]; *S. longispinum* (Bailey) [a very rare form in Ireland. Nordstedt says the Norwegian form agrees with the Swedish *S. bidentatum*, Wittrock. If this be so that author shows the chlorophyll-contents radiate from the centre—that is, falling under the subgenus *Staurastrum*, Lundell, whereas the Irish form, which has also considerably longer spines, has the chlorophyll arranged in broad parallel bands, and certainly appertains to the subgenus *Pleurenterium*, Lundell; it is a very large and beautiful form]; *Xanthidium armatum*, Bréb. [the author alludes to Lundell's record of the zygospores of this species, and their scrobiculate outer membrane, nothing doubting, he observes, that it is so, though he had not taken the zygospores. See on the structure of these Quart. Journ. Micr. Science, vol. xii. n.s., p. 310]; *Tetmemorus Brebissonii* (Menegh.), Ralfs [the author believes the thick-walled membrane of the zygospore to be minutely scrobiculate, but the examples he met with were not mature]; *T. lævis* (Kütz.), Ralfs., and *T. minutus*, De Bary [the author is inclined to regard the latter as a minute form of the former, itself a minute species, and variable in size]; *Closterium Archerianum*, Cleve [rare in Ireland]; *C. Cynthia*, De Notaris [also rare in Ireland]; *C. gracile*, Bréb. [the author very justly remarks that the form referred hereto by Lundell under this name with quadrangular spores, tapering cell, and a long spine at each angle cannot be the same thing as De Brébisson's linear form with round spores without spines; the latter is that occurring to the author in Norway]; *C. directum*, Arch., and *C. Pritchardianum*, Arch. [the former scanty, the latter frequent in Ireland]; *Cylindrocystis diplospora*, Lundell [as the author did not meet conjugated examples in Norway he is uncertain as to the identity in this case; it is a species seemingly very rare in Ireland]; *Penium margaritaceum* (Ehr.), Bréb., "*forma spiralis*" [the author finds in Norway a form having "the dot-like granules arranged in spiral rows," which he supposes to be a connecting link between the ordinary *P. margaritaceum* and *P. spirostriolatum*, Barker (Quart. Journ. Micr. Sci., vol. ix. n.s., p. 124), a form occurring in several places in South and Middle of Ireland, but scantily; the spiral striæ on the latter are *not dotted*, but form thickened ribs, coarser, rougher, and more irregular and interrupted than in *any Closterium*, and the form appears to be wholly distinct from *P. margaritaceum*, though under a low power readily enough overlooked for that species]; *Penium cylindrus*, Bréb. [the author justly remarks the dots are scattered]; *Penium polymorphum*, Lundell [we should be inclined to coincide with the author's view that, when highly magnified, the striæ here appear to be composed of puncta very closely arranged in line; the form is seemingly very rare in Ireland]; *Spondylosium pulchellum*, Arch. [we can hardly doubt but the author is right in regarding *S. bambusinoides*, Wittr., as the same species; indeed there appears little to distinguish the latter even as a variety]; *Hyalotheca mucosa* (Dillw.), Ehr. [the author states that the two minute projections at the margins on each alternate end of the joint are not produced by two annular *entire* projections, but by minute annularly arranged dot-like projections. This seems a new point. The species is everywhere very common].

The foregoing is but a hurried resumé of some of the more salient of the interesting points connected with the Norway *Desmidieæ* to be found in turning over one of the several valuable contributions to this department of algology, the result of the labours of the Scandinavian observers, each of which would indeed equally claim notice, and which resumé has been undertaken at the Editor's request; but at the same time full justice can scarcely be done to such without the detailed descriptions and the requisite illustrations. W. ARCHER.

Botanical News.

ARTICLES IN JOURNALS.—JANUARY.

Grevillea.—M. J. Berkeley, "Notices of North American Fungi" (contd.).—J. Stirton, "On *Solorina bispora*" (*Lecidea epiphorbia*, n.s. described).—M. C. Cooke, "British Fungi" (contd.).

Scottish Naturalist.—J. Keith, "List of Fungi found in Province of Moray, chiefly in vicinity of Forres."—F. Buchanan White, "Description of a Scottish Fungus new to Science" (*Vibrissea Margarita*, n.s.).

Quart. Journ. Microsc. Science.—P. M. Duncan, "On the Motion accompanying Assimilation and Growth in the Fucaceæ"—Abstract of P van. Tieghem and G. Le Monnier's memoir "Researches on the *Mucorineæ*."

Journ Roy. Horticult. Soc. (N.S., vol. iv., pt. 14, Jan. 19th).—J. G. Baker, "A Classified List of all Known Crocuses."

American Naturalist.—W. G. Farlow, "Notes of a Botanist in Europe—Sweden."—C. C. Parry, "Botanical Observations in W. Wyoming."—J. Stockton-Hough, "On the Relationship between Development and the Sexual Condition in Plants."—E. L. Greene, "Rambles of a Botanist in Wyoming Territory."

Bull. Soc. Bot. Roy. de Belgique (t. xii., n. 2, Jan. 13th).—Germain de St. Pierre, "On the Utility of Teratological Studies for the Solution of Problems of Vegetable Life."—A. Cogniaux, "Bibliographical Material for Botanists in Belgium."—C. Baguet, "Note on *Sedum rubens*."—C. H. Delogne, "Contrib. to the Cryptogamic Flora of Belgium."—A. Thielens, "Additions to the Belgian Flora, 1869-1872."

Flora.—W. Pfeffer, "The Oil-Corpuscles in Livermosses" (tab. 1).—W. Nylander, "Addenda nova ad Lichenographiam Europæam, xvii." (34 new species, 5 British).—Dr. Müller, "A Word on the Gonidia Question."—H. de Vries, "Review of Botanical Literature in Holland in 1873."

Bot. Zeitung.—G. Winter, "Heliotropism in *Peziza Fuckeliana*."—

E. Borscow, "Contributions to the Histo-Chemistry of Plants."—P. Ascherson, "Account of Excursion in Africa" (Egypt).—Solms Laubach, "On the Thallus of *Pilostyles Haussknechtii.*"

Oesterr. Bot. Zeitschr.—Biography with portrait of A. Kanitz.—J. Freyn and V. de Janka, "*Micromeria* (*Satureia*) *Rodriguezii*," n.s.—A. Kerner, "Distribution of Hungarian Plants" (contd.).—J. Pantocsek, "On Species of *Scleranthus*" (includes eight new segregate species).—G. Strobl, "Notes of a Journey in Sicily."—H. Kemp, "Supplement to Flora of Neighbourhood of Vorarlberg."

The Linnean Society is passing through a very serious crisis. After the meeting of January 15th (see p. 63) some Fellows of the Society sent in to the Council a written protest against the alterations then made in the bye-laws and requiring their withdrawal as at variance with the charter and illegal. This, of course, the Council refused to accede to, but offered instead to convene a special general meeting if requested to do so by ten Fellows. At the next meeting, February 5th, after the reading of the minutes, a Fellow of the Society rose to propose a motion, but was called to order by the President, Mr. Bentham, who stated that the meeting was for scientific business only. Mr. Carruthers appealed to the bye-laws in support of his right to propose a motion, and in the midst of great confusion succeeded in stating it. It was seconded, but the President still held it to be out of order, and appealed to the meeting as to whether any discussion should be permitted. On a show of hands being taken there appeared a majority in favour of discussion, upon which the President vacated the chair and left the room. He was followed by the Secretary and the other Members of Council, as well as many of the Fellows present, whilst those who remained in the meeting-room signed a requisition for a special general meeting to consider the alterations in the bye-laws and the protest against them. This the Council has agreed to, and the meeting is summoned for March 5th. Such is the history of this unfortunate disagreement, which greater forbearance on either side might have conducted to a more peaceful issue. Great sympathy has been shown for the President, whose long and eminent services to the Society are universally acknowledged and appreciated; at the same time it is felt that his want of conciliation in the chair at both meetings largely contributed to the adverse vote at the latter. It is understood that Mr. Bentham, who had signified to his friends that he would not seek re-election at the next annual meeting, will not take any active part in the meetings during the remainder of the session. The object all now have in view is to bring about reconciliation and harmonious action between the parties in the Society. Much rests with the Council, which will no doubt anxiously consider how this may be best affected. It was stated from the chair at the last ordinary meeting that the whole of the bye-laws needed a careful revision; perhaps the course that would meet with most general acceptance throughout the Society would be the appointment of a competent committee to examine the bye-laws with the object of rendering them consistent with the charter and with one another. Whatever is done, it is earnestly to be hoped that the action taken at the meeting on March 5th will bring to a satisfactory conclusion a state of things most prejudicial to the Society.

Original Articles.

A REVISION OF THE GENERA *DRYOBALANOPS* AND *DIPTEROCARPUS*.

By W. T. Thiselton Dyer, M.A., B.Sc., F.L.S.

(Plates 142-145.)

Having undertaken the *Dipterocarpeæ* for the "Flora of British India," I was naturally led to examine the species which have been described from the Malayan Archipelago. After I had finished the revision of the Indian species a set of Beccari's Bornean collections arrived at Kew. These proved to be extremely rich in new species; and as M. De Candolle was kind enough to forego his intention of describing these in my favour, I determined to prepare a monograph of the whole Order. I was unable to make as much progress with this undertaking as I could have wished, owing to the large number of indeterminable species of *Dipterocarpeæ* which has been published, especially by Miquel and De Vriese. Prof. Suringar, the courteous curator of the Leyden Herbarium, did not feel himself justified in transmitting to Kew the often unique specimens upon which these dubious species were founded, and it seemed therefore unavoidable to leave them still uncorrelated with the more complete materials collected by Beccari, with some of whose plants they must almost certainly be identical.

This being the state of the case, I heard a short time ago from Prof. Decaisne that M. Vesque, one of his pupils, was also preparing a monograph of the Order, to appear in the "Ann. des Sc. Naturelles," and I have therefore determined merely to take this opportunity of publishing what I had already prepared for the press, and to await the appearance of M. Vesque's revision of the remaining genera.

The family of the *Dipterocarpeæ*, established by Blume in 1825, has sprung, so to say, into scientific existence since the commencement of the "Prodromus." In the first volume (p. 517) a single species, *Vatica chinensis*, Linn. (= *Vatica Roxburghiana*, Bl.) is enumerated amongst the *Tiliaceæ*. In the sixteenth volume the monograph of the family as limited by Bentham and Hooker, extends over nearly forty pages. It probably now contains at least 200 species.

In the following enumeration I have contented myself with merely citing authorities in the case of species which have been elsewhere adequately described. I have given full descriptions of new species, and also of those already published, when I have been able to add to or correct what has been already stated about them.

DRYOBALANOPS.

(PL. 142.)

The literature of this genus is rather extensive, especially when it is considered that up to the present time it has been regarded as monotypic. I should be very unwilling to add to the list were it not that all the most recent descriptions, including those of Bentham and Hooker, A. De Candolle and Baillon, appear to me to be in various particulars open to emendation.

The genus was founded by C. F. Gærtner on a plant in the Banksian collection, of which Ceylon was supposed to be the native country. Apparently from the belief that the bark yielded Cinnamon he gave it the specific name of *aromatica*. As there can be no doubt that it is identical with the plant subsequently published by Colebrooke under the name of *D. Camphora*, it appears to me that there is no choice but to agree with Baillon in adopting Gærtner's name in preference to Colebrooke's, although the latter has hitherto been universally adopted.

Gærtner seems only to have seen fruits. The first description of the flower was given by De Vriese in 1851, and appears to have been made from a single flower communicated to De Vriese from the British Museum Herbarium by Robert Brown,* and collected by Mr. Chas. Miller. Subsequently he obtained, with other materials, unexpanded flowers preserved in spirit, and he based upon these an elaborate paper which appeared in 1857, with the title, "Mémoire sur le Camphrier de Sumatra et de Borneo." As regards the structure of the andrœcium the later description appears to me by no means an improvement upon the earlier one. These two papers contain such ample citations of the earlier authorities that it is quite unnecessary to collect them together here. I may merely mention that De Vriese was unable from Miller's specimen to determine the structure of the ovary, and this was afterwards made out by Mr. Bentham from the examination of immature fruits collected by Motley. The ovary is 3-celled, each cell containing two pendulous collateral ovules. One alone of the six enlarges, but, as I have myself verified, it is possible by careful dissection to detect near the apex of the immature seed the abortive remains of the five other ovules, and of the three dissepiments.

The Kew Herbarium contains a sufficient series of specimens of *D. aromatica*, collected by Motley. The piecemeal fashion in which the structure of the genus has gradually been arrived at is characteristic of the difficulties which present themselves in studying the *Dipterocarpeæ*. There is, however, with existing materials no longer any room for doubt, and I have no hesitation in referring to the genus two undescribed species which are contained in Beccari's collections.

DRYOBALANOPS, *Gærtn. fil.*, Fruct., iii., 49, t. 186, char. emend. Calycis floridi tubus brevissimus, laciniæ oblongæ, subæquales, imbricatæ; fructiferi tubus auctus, fructûs basim cingens, laciniæ subæqualiter auctæ obverse oblongo-cuneatæ. Petala basi paullulum cohærentia. Stamina ∞, interdum ad 30, triseriales; filamentis latis, crassis, in tubum basi petalis adhærentem connatis, versus apices angustatis; antheris linearibus, basi emarginatis, apice bifidis, valvis supra inæqualibus, connectivo ultra loculos in apiculum breve producto. Ovarium liberum, 3-loculare; stylus filiformis, sub-capitatus. Capsula sub-lignosa, toro inserta, oblongo-conica, acuta, valvis tribus parte superiore adprimum dehiscens. Seminis fere unici cotyledones carnosæ, valde inæquales, involutæ et ovarii parietum reliquiis tanquam columellæ e tori fundo ortæ circumdatæ.

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* An English translation of this paper by the author's daughter is contained in Hook. Journ., 1852, pp. 33 and 68.

De Vriese in his analysis of a flower from Miller's specimen described the arrangement of the stamens in *D. aromatica* with sufficient accuracy as "in fundo corollæ annulo proprio dentibus tri-angularibus acutis erectis instructo insidentia."* In point of fact the andrœcium of *Dryobalanops* has the pluriseriate stamens with filaments dilated at the base which are characteristic of the order. In *Hopea*, where they are comparatively few in number, there is a tendency towards their becoming connate, and in *Dryobalanops* this is carried so far that they form a tube nearly equalling the ovary in height, and completely inclosing it (see figs. 6, 8, 9). To the base of this tube the petals are slightly adnate.

Out of this really very simple structure De Vriese makes, in his "Mémoire," an elaborate arrangement, according to which the stamens with very short filaments are borne on "processus staminiferi . . . e floris fundo orti et propriæ formæ et structuræ." De Candolle has adopted this curious view, although he inserts parenthetically the obvious explanation with a note of interrogation.† Baillon has probably also been led by De Vriese to state that "les étamines . . . sont libres,"‡ I can, however, see no reason why he should describe them (p. 213) as "∞-seriata." Bentham and Hooker are silent upon these points.

De Vriese also figures the anthers with the valves equal. As in some other Dipterocarpous genera, such as *Shorea* and *Vatica*, the inner valves are really considerably shorter than the outer. This is clearly shown in Baillon's figure (l.c., p. 203); but he, in common with all the other authorities, makes the valves equal in his description of the genus.

The mature fruit has been made the subject of a rather elaborate paper by Oudemans.§ He exposes the error of De Vriese in attributing to *Dryobalanops* a perisperm, and accepts the obvious explanation of Korthals that the so-called "columella" is the residue of the axis of the fruit (see fig. 4). A similar structure may be found in *Fraxinus* and in the immature fruit of *Fagus*. The peculiarity here is that the

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* Hook. Journ., l.c., p. 38.

† Prodr., xvi., pt. 2, 606.

‡ Hist. des Plantes, iv., 203.

§ Ann. des Sc. Nat., 4e, sér. v., 1856.

seed as it were wraps round the axis owing to the extraordinary development of the cotyledons. Prolongations of the testa accompany the convolutions of the embryo and blend with the columella. The cotyledons are exceedingly unequal, and when fully spread out the largest is about two inches broad and one inch in length, while the smaller is nearly orbicular and about half an inch in diameter. Both are cordate at the base, and it is therefore possible to make a section (such as is drawn in fig. 5) passing through the bases of both cotyledons and also the superior radicle. If a section is made rather low down it only shows one cotyledon, as in Gærtner, t. 186, fig. *c.*, and De Vriese, Mem., fig. 51. Oudemans has rather insisted upon the constant existence of a well-marked furrow between the tube and segments of the fruiting calyx. I have selected the fruits figured in the accompanying plate (figs. 1, 2, 3) from a large number in the Kew Museum. Each represents a type, and the existence of a deep furrow below the segments is hardly more characteristic of the fruits generally than is its absence.

1. D. AROMATICA, *Gærtn. f.*, l.c.; Baillon, Hist. des Pl., iv., 202. *D. Camphora*, Colebr., Asiat. Res., xii., 535, cum ic.; Hook., Journ. Bot., 1852, 200, t. 7, 8. A.DC. in DC. Prodr., xvi., 2, 606.

Borneo, Labuan, *Motley*, 85.

[Figs. 1-3, fruits; fig. 4, vertical section through torus and calyx-tube; fig. 5, transverse section through embryo. (All natural size.)]

2. D. BECCARII, *Dyer*, sp. nov. Arbor; glaberrima; foliis oblongo-ellipticis, abrupte acuminatis, basi acutis, costá valida supra canaliculata, modice undulatis; paniculis terminalibus, laxiusculis; calycis floriferi laciniis lineari-oblongis, acutis, cereis; petalis lineari-ellipticis, acutis; calycis fructiferi tubo brevi, paullum incrassato, striato capsulæ quadranti æquante et basim ejus infimam tantum cingente, laciniis auctis lineari-spathulatis obtusis.

Folia 3-3½ poll. longa, 1-1¼ poll. lata, nervis lateralibus utrinsecus crebris; petiolo semipollicari. Paniculæ ad 6 poll. longæ, cymosæ; pedicelli ad ⅛ poll. longi. Calycis floriferi laciniæ ¼ poll. longæ, ⅒ poll. latæ. Petala ½ poll. longa, ¼ poll. lata. Calycis fructiferi laciniæ 2 poll. longæ, ½ poll. latæ. Capsula pollicaris.

Borneo, Sarawak, *Beccari*, 2553, 2944.

[Fig. 6, vertical section through the flower (× 4)—the stamens and staminal tube are shown diagrammatically in section. Fig. 7, fruit (nat. size).]

3. D. OBLONGIFOLIA, *Dyer*, sp. nov. Arbor; paniculis solum pulvereo-puberulis, novellis glaberrimis; foliis oblongis, brevissime acuminatis, basi rotundatis, modice undulatis, costa admodum valida supra canaliculata; paniculis terminalibus laxis, floribus sparsis instructis; calycis floriferi laciniis oblongis, obtusis, demum glabratis, marginibus ciliatis; calycis fructiferi . . . .

Folia 4-5 poll. longa, 1½-1¾ poll. lata, nervis lateralibus utrinsecus crebris; petiolo semipollicari. Panicula ad 8 poll. longa; pedicelli ad ⅛ poll. longi.

Borneo, Sarawak, *Beccari*, 2533, 3734.

[Fig. 8, vertical section as in fig. 6 (×4); fig. 9, portion of staminal tube seen from within (×12); fig. 10, horizontal section through base of flower showing 3-celled ovary and resin-cavities (×8); fig. 11, horozontal section through ovary, and fig. 12,—through calyx lobe (both ×16).]

DIPTEROCARPUS.

(PL. 143-145.)

The discovery of this remarkable genus is due to Dr. Buchanan Hamilton. In the memoirs of the Wernerian Society he remarks (vol. vi., p. 298), "In 1798, I sent to Sir Joseph Banks four species of this genus which I then called *Hopea;* and it was from two of these probably, that Gærtner took his figures and descriptions of the *Dipterocarpus costatus* and *D. turbinatus*." Hamilton, therefore, had no choice but to adopt (1825) what he considered without any very apparent reason to be "the barbarous generic name given by Gærtner" in 1805. Meanwhile Roxburgh had published (1814) the names of two additional species in the "Hortus Bengalensis" (p. 42), and in 1823 Blume had described two of the species peculiar to the Malayan Archipelago in the "Cat. Hort. Buit." and two others (in 1825) in his "Bijdragen." Since then new species have been continually added to the genus, and though there are probably fewer new ones to be expected, since Beccari has ascertained the small extent to which the whole family is represented in New Guinea, no doubt many still remain to be described.

Herbarium specimens of species of *Dipterocarpus* are rarely complete. Generally they consist of examples of the foliage and detached fruits picked up from the ground beneath the very lofty trees. In the absence of satisfactory materials in the majority of cases for describing the inflorescence, I have been obliged to follow the method of Alphonse De Candolle, and classify the species according to the form of the fruit, though I am not wholly satisfied that this affords a perfectly natural arrangement. I have been led in the following enumeration to considerably reduce the number of described species. I have perhaps done this in some instances rather tentatively, but I am convinced that the examination of more complete material will show that the species of this genus are by no means easy in all cases to limit; but that on the contrary, especially as regards vestiture, they are rather variable.

The geographical distribution of the genus is entirely confined to Tropical Eastern Asia. The species range on the West from Assam through Eastern Bengal to Ceylon. Eastward they extend through Burma, Siam to Cambodia and the Philippines. Southward they are found in the Andaman Islands, the Malayan Peninsula, and Borneo, Sumatra, and Banca; but not at present known east of Wallace's line through the Straits of Macassar.

Section 1.—SPHÆRALES. Tube of fruiting calyx oblately or prolately spheroidal without angles.

* *Young branches glabrous or pubescent.*

1. D. TRINERVIS, *Bl.*, Cat. Hort. Buit., 78, *cum tab.*; Bijd., 223; Fl. Jav., 11, t. i.; Korth. Verh. Nat. Gesch. Bat., 61; A.DC. in DC. Prodr., xvi., pt. 2, 608.—*D. Hasseltii*, Bl. Fl. Jav., 22, t. 6, does not appear to me to differ materially.

Var. 1.—*elegans*, Bl. Fl. Jav., 13; Hassk. Pl. Jav. Rar., 270.

Var. 2.—*canescens*, Bl. l.c.

Java, *Spanoghe*, *Horsfield*, *Millett*. Philippines, *Cuming*, 881.

2. D. TURBINATUS, *Gærtn. f.*, Fruct. iii., 51, t. 188; Roxb. Hort. Beng., 42; Fl. Ind., ii., 612; Corom. Pl. iii., 10, t. 213; Ham. in. Mem. Wern. Soc. vi., 300; Wall. Cat., 952; A.DC. in DC. Prodr., xvi., pt. 2, 607; Dyer in Fl. Brit. Ind., i., 295. *D. lævis*, Ham., l.c., 299; A.DC., l.c. *D. indicus*, Bedd. For. Rep. 1864-5, 17, *cum tab.*

Eastern Bengal and Malayan Peninsula from Chittagong and Pegu to Singapore (cult. in Concan and Ceylon). *Walker*, 295; *Maingay*, 199; *Griffith* (*Kew Distrib.* 727); *Thwaites*, 2398.

[Fig. 13, fruit.]

3. D. LITTORALIS *Bl.*, Bijd., 224; Fl. Jav., 17, t. 4; A.DC. in DC. Prodr., l.c., 609.

Differs from *D. retusus*, Bl., in the subcordate base of the leaves.

Java.

4. D. RETUSUS, *Bl.*, Cat. Hort. Buit., 77; Bijd., 223; Fl. Jav., 14, t. 2; A.DC. in DC. Prodr., l.c., 609.

D. Spanoghei, Bl. Fl. Jav., 16, t. 3; A.DC., l.c., 609, only differs in having the enlarged fruit wings not rounded or retuse at the apex.

Java.

5. D. GRACILIS, *Bl.*, Bijd., 224; Fl. Jav. 20, t. 5; A.DC. in DC. Prodr. l.e., 609.

Java.

6. D. LAMPONGUS, *Scheff.*, Obs. Phyt., ii., 34.

7. D. VESTITUS, *Wall.*, Cat., 954; Dyer in Fl. Brit. Ind., i., 295; A.DC. in DC. Prodr., l.c., 614.

Malayan Peninsula, Tavoy, *Gomez*.

* * *Young branches more or less hairy.*

8. D. OBTUSIFOLIUS, *Teysm.*, in Miq. Ann. Mus. Lugd. Bat., i., 214; A.DC. in DC. Prodr., l.c. 608; Dyer, Flor. Brit. Ind., i., 295.

Moulmein and Rangoon, *Griffith* (*Kew Distrib.*, 728). Siam.

9. D. HISPIDUS, *Thw.*, Enum., 33; A.DC. in DC. Prodr. l.c., 608; Dyer, Flor. Brit. Ind., i., 296. *D. oblongifolius*, Thw., Enum., 33 (not of Blume). *D. oblongus*, A.DC. in DC. Prodr., l.c., 608.

Ceylon, *Thwaites* 2903 and 3405.

[Fig. 14, fruit with one of the smaller calyx-lobes abnormally enlarged.]

10. D. PILOSUS, *Roxb.*, Hort. Beng., 93; Fl. Ind., ii., 615; A.DC. in DC. Prodr., l.c., 614; Wall. Cat., 955?; Dyer in Flor. Brit. Ind., i., 296. *D. Baudii*, Korth., l.c., 59, t. 5; Kurz in Journ. As. Soc. Beng. 1870, pt. 2, 65; A.DC. in DC. Prodr., l.c., 609.

Assam, *Griffith* (*Kew Distrib.*, 733). Pegu and Chittagong, *Roxb.* Andaman Isl., *Kurz.* Sumatra.

11. D. TAMPURAU, *Korth.*, l.c., 63; Miq. Fl. Ind. Bat., i., pt. 2, 498.

Borneo.

12. D. CRINITUS, *Dyer*, Fl. Brit. Ind., i., 296.

Malacca, *Maingay* (*Kew Distrib.*, 196). Borneo, *Beccari*, 779, 1883.

Section 2.—TUBERCULATI. Tube of fruiting calyx with 5 angular tuberosities at its upper portion.

13. D. CORNUTUS, *Dyer*, Fl. Brit. Ind., i., 296.

Malacca, *Maingay* (*Kew Distrib.*, 197).

[Fig. 15, fruit.]

14. D. TUBERCULATUS, *Roxb.*, Fl. Ind., ii., 614; A.DC. in DC. Prodr., l.c., 614; Dyer in Flor. Brit. Ind., i., 297. *D. cordatus*, Wall. Cat., 956; A.DC. in DC. Prodr., l.c., 612. *D grandifolius*, Teysm. in Miq. Ann. Mus. Lugd. Bat., i., 214.

Var. grandiflorus, Wall. Cat. 957 (sp.)

Chittagong, *Roxburgh.* Rangoon, *McClelland.* Birma, *Wallich.* Siam.

Section 3.—ANGULATI. Tube of fruiting calyx pentangular.

15. D. BECCARII, *Dyer*, sp. nov. Arbor; novellis gemmisque conicis dense, petiolis nervisque primariis parce pube stellata fulva obductis; foliis ovatis, acutis, basi acutis vel rotundatis, crenato-repandis, glabris, ad nervos laterales supra canaliculatis; calycis fructiferi tubo obtuse pentagono et subconico vel subsphærico, superne versus limbum valde coarctato, levissimo, lobis majoribus oblanceolatis obtusis trinerviis, minoribus oblongis; capsula ovata, tomento ochraceo-sericeo vestita.

Folia 3½-5½ poll. longa, 2-4 poll. lata, nervis lateralibus utrinsecus 12; petiolo -1½1¾ poll. longo. Calycis fructiferi lobi majores 5-7 poll. longi, 1½-2 poll. lati; minores semipollicares.

Borneo, Sarawak, *Beccari*, 2914.

Differs from *D. pentagonus*, DC., by the pubescent conical not cylindrical buds.

Var. glabrata, novellis petiolis nervisque primariis omnino glabris calycis fructiferi tubo obtuse pentagono.

Borneo, Sarawak, *Beccari*, 2915.

[Fig. 16, fruit.]

16. D. ZEYLANICUS, *Thw.*, Enum. 33; A.DC. in DC. Prodr., l.c., 610; Dyer in Fl. Brit. Ind., i., 297.

Ceylon, *Thwaites*, 1921.

17. D. PENTAGONUS, *A.DC.* in DC. Prodr., l.c., 610. *D. Hasseltii*, Korth, l.c., 65 (not of Blume). *D. quinquegonus*, Bl. Mus. Lugd. Bat., ii., 36.

Borneo.

18. D. PRISMATICUS, *Dyer*, sp.nov. Arbor; ramulis gracilibus, ad angulum 45° divergentibus, primum griseis demum glabratis; novellis gemmisque subcylindricis pube fulvida obtectis; foliis papyraceis, elliptico-lanceolatis, gradatim acuminatis, basi acutis, obscure repando-crenatis, utrinque glabris et nervis siccitate prominentibus; petiolo gracili glabro; calycis fructiferi tubo oblongo, pentagono, basi obverse conico, superne ad limbum haud coarctato, levissimo, lobis majoribus oblongo-linearibus apice rotundatis basi paullo angustatis ad medium trinerviis, minoribus rotundatis. *Dipterocarpus*, sp., Hook. fil. in Trans. Soc. Linn., xxiii., 161.

Lignum durum, ponderosum, oleiferum. Folia 3 poll. longa, 1¼ poll. lata, nervis lateralibus utrinsecus circiter 8; petiolo pollicem longo. Calycis fructiferi tubus pollicem longus; lobi majores 3 poll. longi, ¾ poll. lati.

Labuan, *Motley*, 143. Borneo, Sarawak, *Beccari*, 3008.

Fig. 17, fruit.

19. D. ANGULATUS, *Dyer*, sp.nov. Arbor; novellis, racemis gemmisque conicis dense tomentosis; foliis ovatis, obtusis, basi acutis vel rotundatis, minime crenato-repandis, adultis utrinque glabris nervis subtus exceptis; calycis fructiferi tubo obconico, acute pentagono, superne ad limbum parce coarctato, tomento fulvo verruculis rufis intermixto obducto, lobis majoribus lineari-oblongis, obtusis pube stellata sparsim vestitis subtrinerviis, minoribus ovatis.

Folia 4-5 poll. longa, 2-3 poll. lata, nervis lateralibus utrinsecus 10; petiolo sesquipollicari. Calycis fructiferi lobi majores 3 poll. longi, pollicem lati, minores ½ poll. longi.

Borneo, Sarawak, *Beccari*, 3034.

From the description this must be allied to *D. vernicifluus*, Blanco, which appears to differ in the broadly lanceolate leaves pubescent beneath.

20. D. VERNICIFLUUS, *Blanco*, Fl. Filipp., ed. 2, 314; A.DC. in DC. Prodr., l.c., 610. *Mocanera verniciflua*, Blanco, Fl. Filipp., ed. 1., 450.

21. D. APPENDICULATUS, *Scheff.*, Obs. Phyt., ii., 35. Arbor; novellis glabris; gemmis conicis sericeo-pilosis; foliis ovatis, breviter acuminatis, basi acutis vel obtusis, crenato-repandis, utrinque glabris, ad nervos laterales supra canaliculatis; calycis fructiferi tubo sphærico-pentagono, angulis valide acutis, superne versus limbum coarctato, levissimo, lobis majoribus obverse spathulato-linearibus obtusis tri-nerviis glabris, minoribus orbicularibus.

Folia 3-4 poll. longa, 1½-2 poll. lata, nervis lateralibus utrinsecus 12; petiolo pollicem longo. Calycis fructiferi lobi majores 5 poll. longi, pollicem lati; minores ¼ poll. longi.

Banca, *Teysman*; Borneo, Sarawak, *Beccari*, 2913.

Section 4.—ALATI. Tube of fruiting calyx with angles more or less produced into wings.

22. D. SCABER, *Ham.* in Mem. Wern. Soc., vi., 300; Dyer in Flor. Brit. Ind., i., 297. *D. alatus*, A.DC. in DC., Prodr., l.c., 611, in part not of Roxb.

Eastern Bengal, *Hamilton*.

23. D. OBLONGIFOLIUS, *Bl.*, Mus. Lugd. Bat., ii., 36. Arbor; novellis, gemmis cylindricis, petiolis, nervisque primariis fusco-tomentosis an omnino glabratis; foliis oblongis vel elliptico-oblongis, breviter acuminatis, basi acutis, minime repando-crenatis, utrinque glabris; floribus in racemos 2-dichotomos sericeo-tomentosos dispositis; calycis fructiferi immaturi tubo obfusiformi, anguste alato-costato, superne versus limbum parce coarctato, lobis majoribus obverse spathulato-linearibus obtusis sparsim pilosiusculis nervo primario unico, minoribus oblongis—A.DC., Prodr., l.c., 614.

Folia 6-9 poll. longa, 1¾-3 poll. lata, nervis lateralibus utrinsecus circiter 20; petiolo pollicem longo. Calycis fructiferi lobi majores 4 poll. longi, ¾ poll. lati; minores ¼ in. longi.

Borneo, Sarawak, *Beccari*, 3417, 3762.

24. D. MARGINATUS, *Korth.*, l.c., 64. Arbor an arbuscula; ramulis crassis petiolisque pube stellata fusca obductis; foliis papyraceis, ellipticis vel oblanceolatis, breviter acuminatis, basi obtusiusculis vel emarginatis vel interdum acutis, pagina superiore nervis exceptis glabra, subtus præcipue in nervis pubescentibus, repando-crenatis; calycis fructiferi immaturi tubo stipitato, conico, apice coarctato, ad angulos alis ¼ poll. latis, lobis majoribus obverse spathulato-linearibus apice rotundatis basin versus gradatim attenuatis, nervis tribus primariis venis inconspicuis transversim conjunctis, glabris.—Bl. Mus. Lugd. Bat., ii., 37; A.DC. in DC. Prodr., l.c., 613.

Folia surculorum 18 poll. longa, 8 poll. lata; cætera 10-12 poll. longa, 4-5 poll. lata, nervis lateralibus utrinsecus circiter 18; petiolo 1-4 poll. longo. Calycis fructiferi tubus ¾ poll. longus, lobi majores ad 5 poll. longi, pollicem lati.

Borneo, *De Vriese* ex *Herb.* Lugd. Bat.

25. D. GLANDULOSUS, *Thw.*, Enum. 34; A.DC. in DC. Prodr. l.c, 612; Dyer in Flor. Brit. Ind., i., 297.

Ceylon, *Thwaites*, 2590.

26. D. SCABRIDUS, *Thw.*, Enum. 34; A.DC. in DC. Prodr., l.c., 612; Dyer, Flor. Brit. Ind., i., 298.

Ceylon, *Thwaites*, 3406 (fruit only), 2590 in part?

[Fig. 20, fruit.]

27. D. INTRICATUS, *Dyer*, sp.nov. Arbor 50-60-pedalis; foliis chartaceis, oblongo-ovatis, obtusiusculis, basi retusis, unda-

to-crenatis, supra præsertim ad costam pilis stellatis fulvis raro obtectis demum glabratis et plumbeo-lucidis, subtus pube ochracea tenuiter vestitis; petiolo pubescente; calycis fructiferi tubo ovoideo, apice coarctato, ad angulos alis ¼ poll. latis transverse plicatis, lobis majoribus oblongo-linearibus, obtusis, uninerviis.

Folia 6-poll. longa, 4-poll. lata, nervis lateralibus utrinsecus 12; petiolo pollicari. Calycis fructiferi tubus pollicaris, lobi majores 3½ poll. longi, ¾ poll. lati.

[Fig. 21.]

Cambodia, *L. Pierre*.

28. D. PENTAPTERUS, *Dyer*, sp.nov. Arbor; omnino glaber; gemmis cylindricis; foliis ellipticis, obtusiusculis, basi acutis, repando-crenatis; racemis bifidis; calycis floriferi tubo cylindrico, ad angulos angustissime alato, demum fructifero apice paullum coarctato, alis ¼ poll. latis, lobis majoribus late linearibus apice rotundatis basi angustatis ad medium trinerviis, minoribus rotundatis.

Folia 5 poll. longa, 2½ poll. lata, nervis lateralibus utrinsecus 12; petiolo pollicem longo. Pedicelli ¼-½ poll. longi. Petala sesquipollicaria. Calycis fructiferi tubus pollicaris, lobi majores ad 4 poll. longi, ¾ poll. lati.

Borneo, Sarawak, *Beccari*, 2905, 2509.

[Fig. 18.]

29. D. INCANUS, *Roxb.*, Hort. Beng., 42; Fl. Ind., ii., 614; W. & A. Prodr., 84; A.DC. in DC. Prodr., l.c., 611; Dyer in Flor. Brit. Ind., i., 298.

Chittagong, *Roxburgh*. Pegu, *Kurz*.

30. D. INSIGNIS, *Thw.*, Enum., 34; A.DC. in DC. Prodr., l.c., 612; Dyer in Flor. Brit. Ind., i., 298.

Ceylon, *Thwaites*, 3406.

31. D. GRANDIFLORUS, *Blanco*, Fl. Filipp., ed. 2, 314; A.DC. in DC. Prodr., l.c., 612, *D. Blancoi*, Bl. Mus. Lugd. Bat., ii., 35.—*D. Motleyanus*, Hook. f. in Trans. Linn. Soc., xxiii., 159; A.DC. in DC. Prodr., l.c., 611. *D. pterygocalyx*, Scheff., Obs. Phyt., ii., 35; Dyer in Flor. Brit. Ind., i, 298. *Mocanera grandiflora* Blanco, Fl. Filipp., ed. i., 451. *Anisoptera*? Turcz. in Bull. Soc. Nat. Mosc., 1858, i., 233.

Malacca, *Maingay*, 198. Banca, *Teysman*. Philippines, *Cuming*, 1073.

[Fig. 19, fruit.]

32. D. ALATUS, *Roxb.*, Hort. Beng., 42; Fl. Ind., ii., 614; Wall. Cat., 953; A.DC. in DC. Prodr. l.c., 611, in part. Dyer in Flor. Brit. Ind., i., 298. *D. costatus*, Gærtn. f. Fruct. iii., 50, t. 187 (bad). *D. gonopterus*, Turcz. in Bull. Soc. Nat. Mosc., 1863, i., 576; A.DC. in DC. Prodr., l.c., 612. *Oleoxylon balsamiferum*, Wall. Cat., p. 157.

Chittagong, Birma, Tenasserim, *Griffith* (*Kew Distrib.*, 729, 730), Andaman Islands. Siam.

33. D. NOBILIS, *Dyer*, sp.nov. Arbor; ramulis floriferis crassis; novellis, gemmis conicis petiolisque pilis fulvis

fasciculatis obductis; foliis papyraceis, ovatis, abrupte acuminatis, basi rotundatis vel retusis, minime repando-crenatis, pagina superiore nervis exceptis glabra, subtus præcipue in nervis piloso-pubescentibus; racemis bifidis, glabris; floribus magnis; calycis fructiferi purpureo-pruinosi tubo elongato, obverse conico, apice paullo coarctato, ad angulos alis ¾ poll. latis, lobis majoribus oblongo-linearibus, apice rotundatis, basi paullo angustatis, trinerviis; minoribus rotundatis.

Folia 7-8 poll. longa, 4-5½ poll. lata, nervis lateralibus utrinsecus circiter 18; petiolo ad 1¾poll. longo. Racemi 9 poll. longi. Petala 2½ poll. longa. Calycis fructiferi tubus 2½ poll. longus; lobi majores 6 poll. longi, 1½ poll. lati.

Borneo, Sarawak, *Beccari*, 2907, 2555.

The fruit only differs from that of *D. Motleyanus* in having the enlarged lobes more distinctly 3-nerved.

34. D. GRIFFITHII, *Miq.* Ann. Mus. Bot., i., 213; A.DC. in DC. Prodr., l.c., 612; Dyer, in Flor. Brit. Ind. i., 299.—*D. grandiflorus*, Griff. Notul., iv., 515; not of Blanco.

Mergui, *Griffith* (*Kew Distrib.*, 726). South Andaman Islands, *Kurz.*

Section 5. PLICATI. Fruiting calyx tube furnished at the angles with double wings formed by the decurrent margins of the lobes, and transversely plicate.

35. D. LAMELLATUS, *Hook. fil.* in Trans. Soc. Linn., xxiii., 159. Arbor; partibus omnibus junioribus dense tomentosis; foliis ellipticis vel oblongis, breviter acuminatis, supra demum glabratis tunc nitidis, subtus dense fulvo-tomentosis, petiolo gracili; calcycis fructiferi tubo intricate lamellato ut in *D. Lowii* sed dimidio minore, lobis majoribus late linearibus apice rotundatis subuninerviis glabrescentibus purpureo-pruinosis, minoribus rotundatis. A.DC. in DC. Prodr., l.c., 611.

Folia juniora 3 poll. longa, 1¾ poll. lata, nervis lateralibus utrinsecus 12; petiolo pollicem longo. Calycis fructiferi lobi majores ad 5 poll. longi, pollicem lati, minores semipollicares.

Borneo, Labuan, *Motley*, 159, 190?

[Fig. 22, fruit.]

Dr. Hooker considers *D. Baudii*, Korth. (*D. pilosus*, Roxb.) as allied to this; but there seem to be no other points of resemblance beyond the vestiture.

36. D. LOWII, *Hook. fil.* in Trans. Soc. Linn., xxiii., 160. Arbor; novellis, gemmis conicis petiolisque tomento velutino fulvo indutis; foliis coriaceis, oblongo-ovatis, obtuse apiculatis, basi plus minusve cordatis, marginibus integerrimis siccitate reflexis, adultis utrinque glabris, nervis validis supra canaliculatis, subtus primum tomentosis dein glabratis; calycis fructiferi tubo oblongo, superne ad limbum minime coarctato, lobis majoribus oblongis subtrinerviis parce stellato-hispidulis, minoribus rotundatis,

omnium marginibus in lamellas binas semipollicem latas insigniter contortuplicatas decurrentibus et tubo adnatis.

Folia ad 10 poll. longa, 5 poll. lata, nervis lateralibus utrinsecus 21; petiolo circiter sesquipollicem longo, calycis fructiferi lobi majores ad 6 poll. longi, 1¾ poll. lati; minores ¾ poll. longi.

Borneo, *Lowi*; Sarawak, *Beccari*, 1267.

[Fig. 23, flower bud.]

D. validus, Bl. Mus. Ludg. Bat., ii., 36, is probably founded on the barren shoots of this species.

Dubiæ.

37. *D. Mayapis*, Blanco, Fl. Filipp., ed. 2, pp. 313 and 315.
38. *D. angustifolius*, W. & A. Prodr., 84; *D. costatus*, Roxb. Fl. Ind., ii., 613. (not of Gærtn.)
39. *D. balsamifer*, Bl. Mus. Lugd. Bat., ii., 37.
40. *D. elongatus*, Korth., l.c., 62.
41. *D. eurhyncus*, Miq. Fl. Ind. Bat., Suppl. i., 485.
42. *D. eurhynchioides*, Scheff. Obs. Phyt., ii., 34.
43. *D. fulvus*, Bl. Mus. Lugd. Bat., ii., 37.

Excludendæ.

D. polyspermus, Blanco, Fl. Filipp., ed. 2., pp. 312 and 315.
D. Palosapis, Blanco, l.c., 312.

BOTANICAL BIBLIOGRAPHY OF THE BRITISH COUNTIES.

By Henry Trimen, M.B., F.L.S.

(*Continued from page* 73.)

Essex.—[18 South, 19 North; artificially divided. Pr. *Thames*.] Chiefly drains into German Ocean; W. portion in Thames basin; N.W. angle in basin of Ouse.

1.—G. S. Gibson, Flora of E., 1862. Arranged by Bab. Man., ed. 4. Eight artificial districts. Full list of authors quoted given. Cryptogams not included. Old authors worked up.—Additions by A. Irvine in Phyt., N.S., 1862, p. 304, 335, and Bot. Chronicle. Also by J. Britten in Naturalist, i., 314.

2.—Gibs., 359.—Mart., 46.—Gough ii., 64.—B. G., 269.—New B. G., 104, 590.—Cooper, 82.

Woodford.—Warner, Plantæ Woodfordienses, 1774. Alphabetical, names of Ray's Synopsis, ed. 3.

Chelmsford.—Mosses, Greenwood in Phyt. ii., p. 384.

Saffron Walden—Gibson in Phyt. i., 408, 838, 1123.

3.—E. Forster's Herbarium in the British Museum.

Herts.—[20. Pr. *Thames*.] Mainly in Thames; N. portion in Ouse basin.

1.—R. H. Webb & W. H. Coleman, Flora Hertfordiensis, 1849. Natural system. Twelve natural districts by drainage. List of books quoted given. Short list of Mosses; no other Cryptogams.—Supplements in 1851 & 1859.—Additions in Phyt., N.S., 1856, pp. 156, 197, 492, and Journ. Bot., 1872, p. 182; 1874, p. 22.

2.—Gibs., 306.—Mart., 50.—Gough i., 351.—B. G., 330.—New B. G., 103, 589.—R. Chambers in Mag. Nat. Hist., 1838, (N.S. ii.), p. 38.

Hitchin.—Agarics, Dawson in Phyt. i., p. 968.

MIDDLESEX.—[21. Pr. *Thames.*] Entirely in Thames basin.

1.—H. Trimen & W. T. T. Dyer, Flora of M., 1869. Arranged by Syme, E. B., Lond. Cat., & Bab. Man. Seven natural districts by drainage. Complete list of authors quoted given. Lists of Mosses, Lichens, and Fungi (incomplete). Old authors especially attended to.—Additions in Journ. Bot., 1870-1873.

2.—Gibs., 335.—Mart, 64.—Gough ii., 32.—B. G., 399.—New B. G., 97, 586.—Cooper, 98; Supp., 11.

Harefield.—J. Blackstone, Fasciculus pl. circa H. sponte nasc., 1737.

Harrow.—J. C. Melvill, Flora of H., 1864.

Hyde Park & Kensington Gardens.—J. L. Warren in Journ. Bot., 1871, p. 227.

3.—Dr. Trimen's Herbarium in the British Museum.—Mr. Melvill's Herbarium at Harrow School.

Dr. Trimen is collecting additional material.

BERKS.—[22. Pr. *Thames.*] Entirely in Thames basin.

1.—J. Britten, Contrib. to a Flora of B. in Proc. Newbury District Field Club, 1871. Arranged by Lond. Cat., ed. 6. Five artificial districts. List of authors quoted given. Localities for rarer species only. Cryptogams omitted.—Additions, Journ. Bot. 1873, p. 138.

2.—Gibs., 151.—Gough i., 165.—B. G., 25.—New B. G., 163, 602.

Newbury.—J. Lousley, 1839.

Reading.—T. B. Flower, in Robertson's Environs of R., 1843.

Floras of Oxford, Bucks, and Hants often contain Berks localities.

Mr. Britten is collecting additional material.

OXFORD.—[23. Pr. *Thames.*] Nearly all in Thames basin; small portion of N.E. in Ouse; very small piece in Severn basin?

1.—J. Sibthorp, Flora Oxoniensis, 1794. Arranged on Linnean system, with Latin definitions. Includes Cryptogams.—Walker, Flora of O. and its contiguous counties, 1833. Arranged on Linnean system, with short English descriptions. No districts. Cryptogams omitted. Exact area included not defined.—Additions, H. Boswell in Phyt., N. S., 1860, p. 99.—Cryptogams, Baxter and Ayres in Phyt. i., 661, 702.

2.—Gibs., 275.—Mart., 90.—Gough, i., 311.—B. G., 489.—New B G, 166, 603.—Plot, Nat. Hist of O., 1674. Plants, pp. 143-174, with figures.—Blackstone MS. in Bot. Dept. British Museum, 1737 (in Herb. Sloane, vol. 317.)—M. T. Masters in Trans. Ashmolean Soc., 1857.—Daubeny, Specimen of a proposed Index to O. Flora (with Walker's Flora).—See

Morison, Hist. Univ. Plant., 1686; Merrett, Pinax, 1666; Blackstone, Spec. Bot., 1746.

Oxford.—W. T. Thiselton Dyer in Journ. Bot., 1871, p. 145.—Mosses, H. Boswell in Phyt., N. S., 1860, pp. 344, 369; 1861, p. 262; and Journ. Bot., 1872, p. 363.

Banbury.—G. Gulliver, Catalogue, 1841. Linnean system. Cryptogams included; plants collected 1818-24.—T. Beesley in History of B. Natural system. Cryptogams included. 1841.

Goring.—W. Pamplin in Phyt. v., 153.

3.—Baxter's Stirpes Cryptogamicæ Oxonienses, dried specimens.—Gulliver's Herbarium at Lit. Soc. of Chatham.—Dr. Sibthorp's Herbarium, and probably much old material, in the University Herbarium at Oxford.—Blackstone's plants in the British Museum.

Bucks.—[24. Pr. *Thames.*] Southern portion in Thames; northern in Ouse basin.

1.—J. Britten, Flora of B. (a list only), 1867. No districts indicated. Localities not given; chiefly about High Wycombe. Revised list, showing distribution in N. & S. of county in Quart. Mag. H.W.N.H.S., ii., 110, 121 (1868-9). Orchidaceæ of county (localised list), ibid. ii., 73; Ferns, i., 170. Also ibid., i., 171; ii., 157 (lists of localities from old authors.)

2.—Gibs., 286.—Gough i., 322.—B. G., 34.—New B. G., 161, 601.

Marlow.—G. G. Mill in Phyt. i., p. 983.

High Wycombe.—J. Britten in Quart. Mag., H. W. Nat. Hist. Soc. i., 65, 163; ii., 59, 167; in Naturalist, ii. 319, 348; iii., 15, 33, 47, 69, 73, 116, 121, 139 (complete down to Orchidaceæ); and in Bot. Chronicle.

Mr. Britten is collecting additions.

Suffolk.—[25 East, 26 West; separated by line of 1° E. long. Pr. *Ouse.*[Chiefly drained by small rivers flowing into the German Ocean; N.W. portion in Ouse basin.

1.—Henslow & Skepper, Flora of S., 1860. Arranged by Bentham's Handbook. No districts List of authors quoted given. Includes Cryptogams arr. by Eng. Flora. Old authors not consulted.—List by J. Britten in White's Directory of S., 1874.

2.—Gibs., 382.—Mart., 93.—Gough ii., 92.—B. G., 536.—New B. G., 112, 592.—H. Rose, Appendix to Elements of Botany, 1775.—East S., T. W. Gissing in Phyt., N. S., i., 232, 323.—J. E. Smith, English Flora, 1824-8.

Framlingham.—G. Crabbe in Loder's Hist. of F., 1798.

The Yarmouth Floras contain localities in this county.

3.—Prof. Henslow's Herbarium in Ipswich Museum and at Cambridge.

Norfolk.—[27 East, 28 West; separated by the line of 1° E. Long. Pr. *Ouse.*] E. portion drains into German Ocean; W. portion in Ouse basin.

1.—Trimmer, Flora of N., 1866. No districts. Cryptogams not included, but intended to follow. Old authors not consulted. (Parishes of *Burnham*, *Stanhoe*, and *Crostwick* especially attended to.)

2.—Gibs., 402.—Mart., 74.—Gough ii., 118.—B. G., 419.—New B. G., 125, 594.—G. Munford, Botanical productions of N. in White's History of N., ed. 3, 1864. Four districts. Cryptogams included. Previous writers enumerated in preface.—West N. Ib., in Ann. Mag. Nat. Hist., 1841, arr. by Lindley's Synopsis. Numerous localities.—W. Winter in Phyt., N.S., 1861, p. 289.—Fungi, Plowright in Trans. Norf. & Norw. Nat. Hist. Soc., 1873.—Geldart on divisions of N. for botanical purposes, Trans. N. & Norw. N. H. Soc.

Norwich.—H. Rose, App. to Elements of Botany, 1775.—Mann in Mag. Nat. Hist, 1840.—Addenda, S. P. Woodward, Ann. Mag. Nat. Hist., 1844.

Sandringham.—J. Moxon in Phyt. i., 596, 630 (3 miles' radius)..

Yarmouth.—C. J. & J. Paget, Sketch of Nat. Hist. of Y., 1834, 10 miles' radius (includes part of Suffolk). Cryptogams included.—Lowne, Popular Nat. Hist. of Y., 1863, List of rare plants, pp. 43-48.

3.—Sir J. E. Smith's Herbarium at Linnean Society, London.—Dawson Turner's Herbarium at Kew; Rich in Cryptogams.—Hooker's N. plants at Kew.

Mr. H. G. Glasspoole collecting localities in the county.

CAMBRIDGE.—[29. Pr. *Ouse.*] Almost entirely in Ouse basin, a small portion in S.E. drained by Stour flowing into German Ocean.

1.—C. C. Babington, Flora of C., 1860. Eight districts, artificially formed. Cryptogams not included. Full lists of previous authors; old writers after Ray fully worked up and quoted. —Cryptogams, R. Relhan, Flora Cantabrigiensis, ed. 3, 1820.

2.—Gibs., 416.—Gough ii., 144.—B. G., 41.—New B. G. 143, 598.—See W. Turner, Names of Herbes, 1548, and Herball, 1551-68.

G. S. Gibson's Saffron Walden list (see ESSEX) contains localities in C.

BEDFORD.—[30. Pr. *Ouse.*] Mainly in Ouse, but a small part of S. in Thames basin.

1.—C. Abbot, Flora Bedfordiensis, 1798. Linnean system. Short English descriptions. No districts. Cryptogams included.

2.—Gibs., 291.—Gough i., 333.—B. G., 13.—New B. G., 157, 601.

HUNTS.—[31. Pr. *Ouse.*] Entirely in the Ouse basin.

1.—No complete Flora.

2.—Gough ii., 164.—B. G., 335.—New B. G., 155.

Paley's Peterborough List (Northampton) contains some H. plants.

NORTHAMPTON.—[32. Pr. *Ouse.*] Mainly in Ouse, but portions of W. in Severn and Thames basins.

1.—No complete Flora.

2.—Gibs., 442.—Mart., 76.—Gough ii., 189.—B. G., 460.—New B. G., 173, 606.—Morton, Nat. Hist. of N., 1712, pp. 360-407. List of rarer plants arranged by Ray's Synopsis, ed. 2. Fungi, see M. J. Berkeley in Eng. Fl. v., pt. 2, and his numerous papers.

Peterborough.—F. A. Paley, List 1860. Imperfect. Glumiferæ and trees omitted.

Daventry.—W. L. Notcutt in Phyt. i., 500.

Gulliver's Banbury Floras (see Oxford) contain N. localities.

GLOUCESTER.—[33 East, 34 West; artificially divided. Pr. *Severn.*] Chiefly in Severn basin; E. portion in Thames basin; S. part drained by Bristol Avon.

1.—No complete Flora.

2.—Gibs., 251.—Gough i., 283.—B. G., 307.—New. B. G., 187, 616.—G. O. St. Brody in J. Bot. iii., 121; iv., 121.

Cheltenham.—J. Buckman, Bot. Guide to C., 1844. Linnean system. No Cryptogams.—Additions, C. Prentice in Phyt. ii., 884.—C. Coll. Nat. Hist. Soc. Rep., 1870.

Bristol Floras contain localities in G. (see SOMERSET).

St. Vincent's Rocks.—Shiercliff's Bristol Guide, 1793.

3.—S. P. Woodward's Herbarium at R. Agric. Coll. Cirencester. —Cheltenham Nat. Association has a good local herbarium.—Clifton College Nat. Hist. Soc. Herbarium.

Mr. M. J. Barrington-Ward is preparing a Flora of Clifton.

(*To be continued.*)

SHORT NOTES AND QUERIES.

PLANTS OF WARWICKSHIRE.—The following semi-maritime species were noticed growing in and near some pits of salt water at Southam Holt:—*Scirpus maritimus*, *S. glaucus*, *Juncus compressus* and *Carex distans*. The two latter also occur at Chesterton, and the last with *Erythræa pulchella* at Moreton Morrell. I have also found on a high hedgebank between Sherbourne and Claverdon, *Dianthus Armeria*, a very rare plant here. This new locality is of interest, as Perry's old station has become very uncertain of late years.—HENRY BROMWICH.

INFLUENCE OF SOIL ON PLANTS.—"Inquiry might be made by Herbarists, whether the earth be not of the same nature and composition, where the same vegetables grow naturally"?—Joshua Childrey's "Britannica Baconica" (1660 p. 54). Is this the earliest suggestion of the connexion of soil and plants?—R. TUCKER.

TORTULA SINUOSA IN OXFORDSHIRE.—This beautiful little moss which has previously, so far as I am aware, only been found in the counties of Sussex (Davies), Cornwall (Borrer), Devonshire (Holmes), and near Bangor (Wilson), has recently been also found in Oxfordshire. I have a specimen, just received from Mr. F. Westell, gathered by him in the neighbourhood of Witney during the present month, and he writes me that Mr. Boswell has also found it near Oxford. As it does not occur in Mr. Boswell's list of Oxfordshire Mosses, recently published in this Journal, I presume it is a discovery of later date. There is a figure in "Journal of Botany," ix. (1871), p. 289., pl. 120, fig. 6, by Dr. Braithwaite.—CHARLES P. HOBKIRK.

Extracts and Abstracts.

NEW SPECIES OF PHANEROGAMOUS PLANTS IN PERIODICALS PUBLISHED IN GREAT BRITAIN DURING THE YEAR 1873.

This list comprehends the new genera and species published during 1873 in the following periodicals:—"Botanical Magazine," "Gardener's Chronicle," "Icones Plantarum," "Journal of Botany," "Transactions" and "Journal of the Linnean Society," and "Pharmaceutical Journal."

Acacia (vulgares) reniformis, *Benth.* (Leguminosæ Mimoseæ).—Mexico. (Ic. Plant., 1165.)

Adelostigma senegalensis, *Benth.* (Compositæ, Asteroideæ).—Senegambia. (Ic. Plant., 1144.)

Albuca Bainesii, *Baker* (Liliaceæ).—Central S. Tropical Africa. (Journ. Linn. Soc., xiii., p. 290.)

Anacyclus depressus, *Ball* (Compositæ).—Morocco. (Journ. Bot., p. 365.)

A. maroccanus, *Ball*, subsp.—Morocco. (Journ. Bot., p. 365.)

Anchusa atlantica, *Ball* (Boraginaceæ).—Morocco. (Journ. Bot., p. 373.)

Andryala mogadorensis, *Hook. f.* (Compositæ).—Morocco. (Bot. Mag., t. 6010.)

Anthemis tenuisecta, *Ball* (Compositæ).—Morocco. (Journ. Bot., p. 365.)

Aquilegia chrysantha, *A. Gray* (Ranunculaceæ).—New Mexico. (Gard. Chron., p. 1335.)

Arabis conringioides, *Ball* (Cruciferæ).—Morocco. (Journ. Bot., p. 297.)

A. decumbens, *Ball*, subsp.—Morocco. (Journ. Bot., p. 297.)

A. erubescens, *Ball.*—Morocco. (Journ. Bot., p. 297.)

Aristolochia (Diplolobus) recurvilabra, *Hance* (Aristolochiaceæ).—China. (Journ. Bot., p. 75, fig. p. 74.)

Argyrolobium fallax, *Ball*, subsp. (Leguminosæ).—Morocco. (Journ. Bot., p. 302.)

A. microphyllum, *Ball.*—Morocco. (Journ. Bot., p. 303.)

A. stipulaceum, *Ball*, subsp.—Morocco. (Journ. Bot., p. 302.)

Asemnanthe pubescens, *Hook. f.* (Rubiaceæ).—Yucatan. (Ic. Plant., 1145.)

Astragalus atlanticus, *Ball*, subsp. (Leguminosæ).—Morocco. (Journ. Bot., p. 306.)

A. prætermissus, *Ball.*—Morocco. (Journ. Bot., p. 306.)

Aulacocalyx jasminiflora, *Hook. f.* (Rubiaceæ).—Guinea. (Ic. Plant., 1126.)

Begoniella, *Oliver* (Begoniaceæ).—*B. Whitei*, Oliver.—New Grenada. (Trans. Linn. Soc., xxviii., p. 513, tab. 41.)

Belonophora coffeoides, *Hook. f.* (Rubiaceæ).—St. Thomas Island, W. Africa. (Ic. Plant., 1127.)

Berkheya Spekeana, *Oliv.* (Compositæ).—Trop. Africa. (Trans. Linn. Soc., xxviii., p. 100, tab. 66.)

Bernoullia, *Oliver.*—*B. flammea*, Oliver (Sterculiaceæ).—Guatemala, Bernoulli 553. (Ic. Plant., 1169, 70.)

Bidens lineariloba, *Oliver* (Compositæ).—Trop. Africa. (Trans. Linn. Soc., xxviii., p. 99, tab. 60.)

Bolusia, *Benth.*—*B. capensis*, Benth. (Leguminosæ, Galegeæ).—Cape Colony. (Ic. Plant., 1163.)

Bothriocline Schimperi, *Oliv. & Hiern.* (Compositæ; Vernoniaceæ).—Abyssinia; Mount Kilimanjaro. (Ic. Plant., 1133.)

Brassica elata, *Ball* (Cruciferæ).—Morocco. (Journ. Bot., p. 298.)

B. nervosa, *Ball.*—Morocco. (Journ. Bot., p. 299.)

B. rerayensis, *Ball.*—Morocco. (Journ. Bot., p. 298.)

Brownea macrophylla, *Hort. Crawfurd.*—*B. cauliflora?* Poepp. & Endl. (Leguminosæ, Cæsalpineæ).—Hort. Crawfurd. (Gard. Chron., p. 777, fig. 149.)

Calendula maroccana, *Ball* (Compositæ).—Morocco. (Journ. Bot., p. 367.)

Calocedrus, *Kurz.* (Coniferæ).—*C. macrolepis*, Kurz.—Yunan. (Journ. Bot., p. 196, tab. 133, fig. 3.)

Carduncellus lucens, *Ball* (Compositæ).—Morocco. (Journ. Bot., p. 370.)

Carduus Ballii, *Hook. f.* (Compositæ).—Morocco. (Journ. Bot., p. 368.)

Centaurea Cossoniana, *Ball* (Compositæ).—Morocco. (Journ. Bot., p. 369.)

C. maroccanus, *Ball.*—Morocco. (Journ. Bot., p. 370.)

Chalepophyllum guyanense, *Hook. f.* (Rubiaceæ).—British Guiana. (Ic. Plant., 1148.)

Chiliocephalum Schimperi, *Benth.* (Compositæ Gnaphaleæ).—Abyssinia. (Ic. Plant., 1137.)

Chirita speciosa, *Kurz.* (Cyrtandraceæ).—Yunan. (Journ. Bot., p. 195.)

Chrysanthemum atlanticum, *Ball* (Compositæ).—Morocco. (Journ. Bot., p. 366.)

C. Catananche, *Ball.*—Morocco. (Journ. Bot., p. 366.)

C. Mawii, *Hook. f.*—Morocco. (Journ. Bot., p. 366.)

Cnicus chrysacanthus, *Ball* (Compositæ).—Morocco. (Journ. Bot., p. 369.)

C. ornatus, *Ball.*—Morocco. (Journ. Bot., p. 368.)

Codonopsis convolvulacea, *Kurz.* (Campanulaceæ).—Yunan. (Journ. Bot., p. 195.)

Coreopsis Grantii, *Oliver* (Compositæ).—Trop. Africa. (Trans. Linn. Soc., xxviii., p. 98, tab. 65.)

Coronilla pulchra, *Ball* (Leguminosæ).—Morocco. (Journ. Bot., p. 307.)

C. ramosissima, *Ball*, subsp.—Morocco. (Journ. Bot., p. 307.)

Cotyledon Cossoniana, *Ball*, subsp. (Crassulaceæ).—Morocco. (Journ. Bot., p. 332.)

Crassula (Perfilata) profusa, *Hook. f.* (Crassulaceæ).—Cape Colony. (Bot. Mag., t. 6044.)

Cremanthodium palmatum, *Benth.* (Compositæ, Senecionidæ).—Sikkim Himalaya. (Ic. Plant., 1142.)

C. pinnatifidum, *Benth.*—Sikkim Himalaya. (Ic. Plant., 1142.)

Crepis (Omalocline) Hookeriana, *Ball* (Compositæ).—Morocco. (Journ. Bot., p. 371.)

C. stellata, *Ball*, subsp.—Morocco. (Journ. Bot., p. 371.)

Crocus aleppicus, *Baker* (Irideæ).—Aleppo. (Gard. Chron., p. 609.)

Ctenolophon, *Oliver* (Olacineæ ?)—*C. parvifolius*, Oliver.—Malaya, Maingay, n. 382. (Trans. Linn. Soc., xxviii., p. 516, tab. 43.)

C. grandifolius, *Oliver*.—Malacca, Maingay, n. 383. (Trans. Linn. Soc., xxviii., p. 59.)

Cyclophyllum Deplanchei, *Hook. f.* (Rubiaceæ).—New Caledonia. (Ic. Plant., 1158.)

Cynara hystrix, *Ball* (Compositæ).—Morocco. (Journ. Bot., p. 369.)

Cypripedium Argus, *Rchb. f.* (Orchidaceæ).—Penang ? or Phillippines ? (Gard. Chron., p. 608.)

Dichotomanthes, *Kurz.* (Lythraceæ).—*D. tristaniæcarpa*, Kurz.——Yunan. (Journ. Bot., p. 194, tab. 133, fig. 2.)

Dicoma karaguensis, *Oliv.* (Compositæ).—Trop. Africa. (Trans. Linn. Soc., xxviii., p. 103, tab. 70.)

Dioscorea illustrata, *Hort. Bull.* (Dioscoreaceæ), Rio Grande do Sul. (Gard. Chron., p. 1731, fig. 345.)

Dracæna Porteri, *Baker* (Asparagaceæ).—Penang. (Journ. Bot., p. 262.)

Echinops amplexicaulis, *Oliv.* (Compositæ).—Trop. Africa. (Trans. Linn. Soc., xxviii., p. 101, tab. 67.)

Echium modestum, *Ball* (Boraginaceæ).—Morocco. (Journ. Bot., p. 373.)

Elleanthus xanthocomus, *Reichenb. f.* (Orchidaceæ). — Peru. (Bot. Mag., t. 6016.)

Emilia cæspitosa, *Oliv.* (Compositæ).—Trop. Africa. (Trans. Linn. Soc., xxviii., p. 100.)

Epidendrum physodes, *Rchb. f.* (Orchidaceæ).—Costa Rica. (Gard. Chron., p. 289.)

Erigeron Grantii, *Oliv. & Hiern.* (Compositæ).—Trop. Africa. (Trans. Linn. Soc., xxviii., p. 93, tab. 58.)

Erythrocephalum longifolium, *Benth. MS.* (Compositæ).—Trop. Africa. (Trans. Linn. Soc., xxviii., p. 102.)

E. minus, *Oliv.*—Trop. Africa. (Trans. Linn. Soc., xxviii., p. 103.)

E. nutans, *Benth. MS.*—Trop. Africa. (Trans. Linn. Soc., xxviii., p. 102, tab. 69.)

Erythrostaphyle, *Hance* (Verbenaceæ ?)*—*E. vitiginea*, Hance.—China. (Journ. Bot., p. 266.)

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* This proves to be a new species of the curious genus *Iodes*, as I learn from a letter received from Dr. Hance.—[*Ed. Journ. Bot.*]

Escallonia Philippiana, *Mast.* (*E. virgata*, var. *Philippiana*, Engler), (Saxifragaceæ).—Valdivia. (Gard. Chron., p. 947.)

Eurycoma apiculata, *A. W. Benn.* (Simarubeæ).—Penang. (Pharmaceutical Journ., iii., p. 882.)

Fadogia fuchsioides, *Welw. MS.* (Rubiaceæ).—Trop. Africa. (Trans. Linn. Soc., xxviii., p. 85, tab. 50.)

Filago atlantica, *Ball* (Compositæ).—Morocco. (Journ. Bot., p. 364.)

Fumana arbuscula, *Ball* (Cistaceæ).—Morocco. (Journ. Bot., p. 300.)

Fumaria tenuisecta, *Ball*, subsp.* (Fumariaceæ).—Morocco. (Journ. Bot., p. 297.)

Galium acuminatum, *Ball* (Rubiaceæ).—Morocco. (Journ. Bot., p. 334.)

G. atlanticum, *Ball*, subsp.—Morocco. (Journ. Bot., p. 334.)

G. noli-tangere, *Ball.*—Morocco. (Journ. Bot., p. 335.)

Gaultheria crenulata, *Kurz.* (Ericaceæ).—Yunan. (Journ. Bot., p. 195.)

Genista maroccana, *Ball*, subsp. (Leguminosæ).—Morocco. (Journ. Bot., p. 303.)

G. myriantha, *Ball.*—Morocco. (Journ. Bot., p. 303.)

Gnaphalium ? helichrysoides, *Ball* (Compositæ).—Morocco. (Journ. Bot., p. 364.)

Gutenbergia cordifolia, *Benth. MS.* (Compositæ).—Trop. Africa. (Trans. Linn. Soc., xxviii., p. 90, tab. 55.)

Guthrieat, *Bolus.*—*G. capensis*, Bolus (Passifloreæ, Acharieæ).—Cape Colony. (Ic. Plant., 1161.)

Gymnopentzia bifurcata, *Benth.* (Compositæ).—S. Africa. (Ic. Plant., 1155.)

Hekistocarpa minutiflora, *Hook. f.* (Rubiaceæ).—Old Calabar. (Ic. Plant., 1151.)

Helichrysum Kirkii, *Oliv.* & *Hiern.* (Compositæ).—Trop. Africa. (Trans. Linn. Soc., xxviii., p. 95, tab. 61.)

Heterophyllæa pustulata, *Hook. f.* (Rubiaceæ).—La Plata. (Ic. Plant., 1134.)

Hippocrepis atlantica, *Ball* (Leguminosæ).—Morocco. (Journ. Bot., p. 307.)

Hydrothrophus, *C. B. Clarke* (Hydrocharidaceæ).—*H. echinospermus*, Clarke.—E. Bengal. (Journ. Linn Soc., xiv., p. 8, tab. 1.)

Hymenocardia ulmoides, *Oliv.* (Euphorbiaceæ).—Zanzibar; Angola. (Ic. Plant., 1131.)

Hymenostephium mexicanum, *Benth.* (Compositæ).—Mexico, Bourgeau, n. 1932. (Ic. Plant., 1154.)

Hypochæris leontodontoides, *Ball* (Compositæ).—Morocco. (Journ. Bot., p. 371.)

Hypoxis longifolia, *Hook. f.* (Hypoxideæ).—Cape Colony. (Bot. Mag., t. 6035.)

Ixora (Pavetta) tenuifolia, *Hook. f. MS.* (Rubiaceæ).—Trop. Africa. (Trans. Linn. Soc., xxviii., p. 86, tab. 51.)

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* This name is preoccupied, being used by Boswell Syme as a super-species to include *F. parviflora* and *F. Vaillantii.*—[*Ed. Journ. Bot.*]

Jasione atlantica, *Ball* (Campanulaceæ).—Morocco. (Journ. Bot., p. 373.)

J. cornuta, *Ball.*—Morocco. (Journ. Bot., p. 373.)

Koompassia, *Maingay.*—*K. malaccensis,* Maingay (Leguminosæ, Cassieæ).—Malacca. (Ic. Plant., 1164.)

Lælia harpophylla, *Rchb. f.*, "n.sp. or hybr." (Orchidaceæ).—Hort. Day. (Gard. Chron., p. 542.)

Lathyrus fissus, *Ball* (Leguminosæ).—Morocco. (Journ. Bot., p. 332.)

Lefeburia brachystyla, *Hiern* (Umbelliferæ).—Trop. Africa. (Trans. Linn. Soc., xxviii., p. 60.)

Leontodon Ballii, *Benth.*, subsp. (Compositæ).—Morocco. (Journ. Bot., p. 372.)

L. trivialis, *Ball.*—Morocco. (Journ. Bot., p. 372.)

Leptoscela ruellioides, *Hook. f.* (Rubiaceæ).—Bahia, Blanchet 2399. (Ic. Plant., 1149.)

Lilium philippense, *Baker* (Liliaceæ).—Philippine Islands. (Gard. Chron., p. 1141, fig. 243.)

Loranthus usuiensis, *Oliv.* (Loranthaceæ).—Trop. Africa. (Trans. Linn. Soc., xxviii., p. 80, tab. 44.)

Lotononis maroccana, *Ball* (Leguminosæ).—Morocco. (Journ. Bot., p. 302.)

Lotus (Pedrosia) maroccanus, *Ball* (Leguminosæ).—Morocco. (Journ. Bot., p. 306.)

Luina hypoleuca, *Benth.* (Compositæ, Senecionidæ?)—North West America. (Ic. Plant., 1139.)

Lysimachia (Lysimastrum) Christinæ, *Hance* (Primulaceæ).—China. (Journ. Bot., p. 167.)

Maingaya, *Oliver* (Hamamelideæ).—*M. malayana,* Oliver.—Penang, Maingay, n. 1518. (Trans. Linn. Soc., xxviii., p. 517, tab. 44.)

Marupà, *Miers* (Simarubaceæ).—*M. Francoana.*—Brazil. (Journ. Bot., p. 260, tab. 135B.)

Masdevallia nycterina, *Rchb. f.* (Orchideæ). Hort. Day. (Gard. Chron., p. 1237.)

Matricaria maroccana, *Ball.* (Compositæ).—Morocco. (Journ. Bot., p. 366.)

Maxillaria porphyrostelæ, *Rchb. f.* (Orchideæ).—Brazil. (Gard. Chron., p. 978.)

Melianthus Trimenianus, *Hook. f.* (Sapindaceæ).—Cape Colony. (Journ. Bot., p. 353, tab. 138.)

Meninia, *Fua MS.* (Acanthaceæ).—*M. turgida,* Fua MS.—Cochin China. (Bot. Mag., t. 6043.)

Merendera Aitchisoni, *Hook. f.* (Melanthaceæ).—Punjab. (Bot. Mag., t. 6012.)

Mesembryanthemum brachyphyllum, *Welw. MS.* (Ficoideæ).—Portugal. (Journ. Bot., p. 289, tab. 136.)

Monanthes atlantica, *Ball* (Crassulaceæ).—Morocco. (Journ. Bot., p. 333.)

Morina betonicoides, *Benth.* (Dipsaceæ).—Sikkim. (Ic. Plant., 1171.)

Nasturtium atlanticum, *Ball* (Cruciferæ).—Morocco. (Journ. Bot., p. 297.)

Nidularium spectabile, *T. Moore* (Bromeliaceæ).—South America. (Gard. Chron., p. 8.)

Notopora, *Hook. f.* (Ericeæ, Vaccineæ).—British Guiana. Schomburgk, 566, 567, 1038. (Ic. Plant., 1159.)

Odontoglossum Roezlii, *Rchb. f.* (Orchidaceæ).—New Grenada. (Gard. Chron., p. 1302, fig. 269.)

O. Ruckerianum, *Rchb. f.* (Gard. Chron., p. 105, fig. 18.)

Oldenlandia effusa, *Oliv.* (Rubiaceæ).—Trop. Africa. (Trans. Linn. Soc., xxviii., p. 84, tab. 48.)

Oncidium (cyrtochila auriculata) Baldeviamæ, *Rchb. f.* (Orchidaceæ).—New Grenada. (Gard. Chron., p. 915.)

O. dasystyle, *Rchb. f.*—Organ Mountains. (Gard. Chron., p. 253.)

O. (cyrtochila exauriculata) plagianthum, *Rchb. f.*—New Grenada. (Gard. Chron., p. 915.)

O. rotundifolium, *Rchb. f.*—Hort. Dawson. (Gard. Chron., p. 978.)

O. stelligerum, *Rchb. f.*—Hort. Backhouse. (Gard. Chron., p. 1398.)

O. (cyrtochila auriculata) tetracopis, *Rchb. f.*—New Grenada. (Gard. Chron., p. 915.)

Ononis atlantica, *Ball* (Leguminosæ).—Morocco. (Journ. Bot., p. 304.)

O. Maweana, *Ball.*—Morocco. (Journ. Bot., p. 304.)

O. polyphylla, *Ball.*—Morocco. (Journ. Bot. p. 304.)

Ornithogalum Bolusianum, *Baker* (Liliaceæ).—Cape Colony. (Journ. Linn. Soc., xiii., p. 279.)

O. comptum, *Baker.*—Cape Colony. (Journ. Linn. Soc., xiii., p. 274.)

O. ? (Ledebouriopsis) Cooperi, *Baker.*—Cape Colony. (Journ. Linn. Soc., xiii., p. 284.)

O. deltoideum, *Baker.*—Cape Colony. (Journ. Linn. Soc., xiii., p. 281.)

O. griseum, *Baker.*—Cape Colony. (Journ. Linn. Soc., xiii., p. 281.)

O. Kirkii, *Baker.*—Zambesi. (Journ. Linn. Soc. xiii., p. 279.)

O. macranthum, *Baker.*—Cape Colony. (Journ. Linn. Soc., xiii., p. 280.)

O. Melleri, *Baker.*—S. E. Tropical Africa. (Journ. Linn. Soc., xiii., p. 280.)

O. multiflorum, *Baker.*—Cape Colony. (Journ. Linn. Soc., xiii., p. 271.)

O. pubescens, *Baker.*—Cape Colony. (Journ. Linn. Soc., xiii., p. 282.)

O. virgineum, *Soland. MS.*—Cape of Good Hope. (Journ. Linn. Soc., xiii., p. 271.)

O. Zeyheri, *Baker.*—Cape Colony. (Journ. Linn. Soc., xiii., p. 281.)

Otomeria madiensis, *Oliv.* (Rubiaceæ).—Trop. Africa. (Trans. Linn. Soc., xxviii., p. 83, tab. 47.)

Otopappus verbesinoides, *Benth.* (Compositæ).—Nicaragua. (Ic. Plant., 1153.)

Papaver tenue, *Ball* (Papaveraceæ).—Morocco. (Journ. Bot., p. 296.)

Pentas purpurea, *Oliv.* (Rubiaceæ).—Trop. Africa. (Trans. Linn. Soc., xxviii., p. 83.)

Peucedanum Grantii, *Kingston MS.* (Umbelliferæ). — Trop. Africa. (Trans. Linn. Soc., xxviii., p. 79, tab. 43.)

Phagnalon bicolor, *Ball* (Compositæ).—Morocco. (Journ. Bot., p. 364.)

Philydrum (orthothylax) glaberrimum, *Hook. f.* (Philydreæ).—Pacific Islands? (Bot. Mag., t. 6056.)

Phyllactinia Grantii, *Benth. MS.* (Compositæ).—Trop. Africa, (Trans. Linn. Soc., xxviii., p. 102, tab. 68.)

Physotrichia, *Hiern* (Umbelliferæ).—*P. Welwitschii*, Hiern.—Angola. (Journ. Bot., p. 161, tab. 182.)

Physurus decorus, *Rchb. f.* (Orchideæ).—Sumatra. (Gard. Chron., p. 177.)

P. nobilis, *Rchb. f.*—Brazil. (Gard. Chron., p. 177.)

Picris albida, *Ball* (Compositæ).—Morocco. (Journ. Bot., p. 370.)

Plagiocarpus, *Benth.*—*P. axillaris*, Benth. (Leguminosæ Galegeæ?) —Tropical Australia. (Ic. Plant., 1162.)

Platyloma bellum, *T. Moore* (Filices).—California. (Gard., Chron., p. 213.)

P. brachypterum, *T. Moore.*—California. (Gard. Chron., p. 141.)

Plectronia venosa, *Oliv.* (Rubiaceæ). Trop. Africa. (Trans. Linn. Soc., xxviii., p. 85, tab. 49.)

Pluchea frutescens, *Benth.* (Compositæ).—Scinde and Punjab. (Ic. Plant., 1157.)

P. pinnatifida, *Hook. f.*—Somali Country. (Ic. Plant., 1156.)

Polycarpon herniarioides, *Ball* (Caryophyllaceæ).—Morocco. (Journ. Bot., p. 301.)

Porana stenoloba, *Kurz.* (Convolvulaceæ).—Sikkim. (Journ. Bot., p. 136.)

P. spectabilis, *Kurz.*—Martaban. (Journ. Bot., p. 136.)

P. truncata, *Kurz.*—Pegu and Martaban. (Journ. Bot., p. 136.)

Porphyrostemma Grantii, *Benth. MS.* (Compositæ). — Trop. Africa. (Trans. Linn. Soc., xxviii., p. 96, tab. 63.)

Poterium anceps, *Ball* (Rosaceæ).—Morocco. (Journ. Bot., p. 332.)

Psilanthus Mannii, *Hook. f.* (Rubiaceæ).—Fernando Po. (Ic. Plant., 1129.)

Pteleocarpa, *Oliv.* (Olacineæ).—*P. malaccensis*, Oliv.—Malacca. (Trans. Linn. Soc., xxviii., p. 515, tab. 42.)

Pulicaria Grantii, *Oliv. & Hiern.* (Compositæ).—Trop. Africa. (Trans. Linn. Soc., xxviii., p. 96, tab. 64.)

P. longifolia, *Ball*, subsp. —Morocco. (Journ. Bot., p. 364.)

Ranunculus atlanticus, *Ball*, subsp. (Ranunculaceæ).—Morocco. (Journ. Bot., p. 296.)

R. leucothrix, *Ball*, subsp.—Morocco. (Journ. Bot., p. 296.)

Reseda attenuata, *Ball*, subsp. (Resedaceæ).—Morocco. (Journ. Bot., p. 299.)

R. diffusa, *Ball*, subsp.—Morocco. (Journ. Bot., p. 299.)

Rigiolepis, *Hook. f.*—*R. borneensis*, Hook. f. (Vaccinieæ.)—Sarawak. (Ic. Plant., 1160.)

Rubus (Dalibarda?) debilis, *Ball* (Rosaceæ).—Morocco. (Journ. Bot., p. 332.)

Salmeopsis Claussenii, *Benth.* (Compositæ).—Brazil. (Ic. Plant., 1152.)

Santolina scariosa, *Ball* (Compositæ).—Morocco. (Journ. Bot., p. 365.)

Schizobasis, *Baker* (Liliaceæ).—*S. Macowani*, Baker.—Cape Colony. (Journ. Bot., p. 105.)

Sedum modestum, *Ball*, (Crassulaceæ).—Morocco. (Journ. Bot., p. 333.)

Sempervivum atlanticum, *Ball*, subsp.? (Crassulaceæ).—Morocco. (Journ. Bot., p. 333; Bot. Mag., t. 6055.)

Senecio discifolius, *Oliv.* (Compositæ).—Trop. Africa. (Trans. Linn. Soc., xxviii., p. 100.)

Silene adusta, *Ball*, subsp.? (Caryophyllaceæ). — Morocco. (Journ. Bot., p. 301.)

S. corrugata, *Ball.*—Morocco. (Journ. Bot., p. 301.)

S. decipiens, *Ball*, subsp.—Morocco. (Journ. Bot., p. 300.)

Sladenia, *Kurz.* (Ternstrœmiaceæ).—*S. celastrifolia*, Kurz.—Yunan. (Journ. Bot., p. 194, tab. 133, fig. 1.)

Solenandra ixoroides, *Hook. f.* (Rubiaceæ).—Cuba. (Ic. Plant., 1150.)

Sonchus fragilis, *Ball.* (Compositæ).—Morocco. (Journ. Bot., p. 372.)

Sonerila Bensoni, *Hook. f.* (Melastomaceæ).—Madras. (Bot. Mag., t. 6049.)

Spermacoce dibrachiata, *Oliv.* (Rubiaceæ). — Trop. Africa. (Trans. Linn. Soc., xxviii., p. 87, tab. 52.)

S. Kotschyana, *Oliv.* (Rubiaceæ). Trop. Africa. (Trans. Linn. Soc., xxviii., p. 88, tab. 53.)

Sphæranthus polycephalus, *Oliv. & Hiern.* (Compositæ).—Trop. Africa. (Trans. Linn. Soc., xxviii., p. 95, tab. 59.)

Stellaria vestita, *Kurz.* (Caryophyllaceæ).—Yunan. (Journ. Bot., p. 194.)

Stilpnophyllum lineatum, *Hook. f.* (Rubiaceæ).—East Peru. Spruce, 4568. (Ic. Plant., 1147.)

Symphoricarpus longiflorus, *A. Gray* (Caprifoliaceæ).—Nevada, U.S.A. (Journ. Linn. Soc., xiv. p. 12.)

Syringodea, *Hook. f.*—*S. pulchella*, Hook. f. (Irideæ).—Cape Colony. (Bot. Mag., t. 6071.)

Tacsonia insignis, *Mast.* (Passifloraceæ).—S. America. (Gard. Chron., p. 1112, fig. 230; & Bot. Mag., t. 6069.)

Tamarix speciosa, *Ball*, subsp. (Tamaricaceæ).—Morocco. (Journ. Bot., p. 301.)

Trifolium atlanticum, *Ball* (Leguminosæ).—Morocco. (Journ. Bot., p. 306.)

T. humile, *Ball.*—Morocco. (Journ. Bot., p. 305.)

VERNONIA GRANTII, *Oliv. & Hiern.* (Compositæ).—Trop. Africa. (Trans. Linn. Soc., xxviii., p. 92, tab. 57.)

V. KARAGUENSIS, *Oliv. & Hiern.* (Compositæ).—Trop. Africa. (Trans. Linn. Soc., xxviii., p. 91.)

V. PETERSII, *Oliv. & Hiern.* Trop. Africa. (Trans. Linn. Soc., xxviii., p. 90.)

V. THOMSONIANA, *Oliv. & Hiern.*—Trop. Africa. (Trans. Linn. Soc., xxviii., p. 91.)

V. TURBINATA, *Oliv. & Hiern.*—Trop. Africa. (Trans. Linn. Soc., xxviii., p. 90, tab. 56.)

V. VIOLACEA, *Oliv. & Hiern.*—Trop. Africa. (Trans. Linn. Soc., xxviii., p. 91.)

VIOLA MODESTA, *Ball* (Violaceæ).—Morocco. (Journ. Bot., p. 300.)

WEDELIA MOSSAMBICENSIS, *Oliv.* (Compositæ).—Trop. Africa. (Trans. Linn. Soc., xxviii., p. 97.)

XERANTHEMUM MODESTUM, *Ball* (Compositæ).—Morocco. (Journ. Bot., p. 368.)

ZINGIBER PARISHII, *Hook. f.* (Scitamineæ).—Moulmein. (Bot. Mag., t. 6019.)

Notices of Books.

Repertorium annuum Literaturæ Botanicæ Periodicæ curavit J. A. VAN BEMMELEN. Tom. i., 1872. Haarlem, 1873. (Pp. 224.)

THE compiler of this useful volume is the keeper of the Teyler Society's Library at Haarlem, and has performed a task which entitles him to the thanks of all working botanists, in exhibiting, on a convenient and well-arranged system, the botanical work of a year as represented in the periodicals to which he has had access. The number of these amounts to ninety-two, of which thirty-six are independent journals, and the remainder proceedings or other publications of scientific societies. Only twenty-one are purely botanical (and of these but five are published by botanical societies); the remainder are periodicals devoted to general science. Newspapers—*i.e.*, periodicals of which the bulk of the contents is anonymous—are not quoted; apparently the only exception to this (among English periodicals at least) being "Nature." Horticultural publications are also omitted, yet it would seem certainly most desirable to have quoted such periodicals as the "Gardener's Chronicle" and the "Belgique Horticole," in which so much good botanical matter is published. In a work of this sort it is a fault very much on the right side to include what is beyond the immediate scope if likely to be of use. No doubt in future volumes—and it is to be greatly desired that the author will continue the work—the omissions in this first attempt will be largely filled up. There is great room for this. Among English periodicals in which botanical papers more or less frequently occur, but which have not come under the notice of the author, may be mentioned the "Pharmaceutical Journal," the "Annals and Magazine of Natural History," the "Journal of the Horticultural Society," the "Monthly Microscopical Journal," and the Transactions of the Irish Academy, of the Royal Society of Edinburgh, and of the Cambridge Philosophical Society. In foreign literature, the author might add to his list in America and the British Colonies, and the roll of Scandinavian periodicals is wofully incomplete, the important publications of the Academies and Universities of Stockholm, Copenhagen, Lund, Helsingfors, &c., receiving no notice. It may be suggested that a list of periodicals arranged under the names of countries or places would be a useful addition to future annual volumes, and lead towards obtaining a complete enumeration of them all.

Contrary to usual custom the faults of the book have been pointed out first; they are wholly those of omission, and only serve to show the difficulties anyone must meet with who attempts to get together the periodical literature of the world on a given subject for a year. There can be nothing but commendation for the way in which the author has treated his material; he has apparently extracted everything of value from it, and has arranged all in a very handy form for reference. The articles are classified under the heads of (as recommended by Sachs) General Morphology, Special Morphology (under natural Orders), Physiology, Monographs (under natural Orders), Floras (under countries), and General Botany. The natural Orders follow the sequence of Pfeiffer's compendious "Synonymia Botanica," 1870. A complete index to authors' names concludes the volume.

A somewhat careful search through the English portion has revealed very few errors of any sort, and evidence of unusual carefulness and precision. The geography is occasionally faulty; Moab is not in Europe, nor is Vectis one of the Pacific Oceanic Islands. But little slips of this sort are sure to creep in, and detract in but a very small degree from the usefulness of the volume, which should be in all public scientific libraries, and will save many a tiresome and fruitless search for papers the reference to which has been lost or mislaid.

H. T.

Icones Selectæ Hymenomycetum Hungariæ. Per STEPHANUM SCHULZER ET CAROLUM KALCHBRENNER. No. I. Pesth.

THE first part of this work, which if continued is likely to prove valuable, contains ten plates of Agarics beautifully printed in colours, the accompanying letterpress being printed in the Hungarian and Latin languages. In size the work corresponds with Fries's famous "Icones Selectæ Hymenomycetum Hungariæ" and the ten plates contain figures of twenty-one species, of which fourteen are new and now first described by the authors. Some notice of this book has already appeared in these pages (Journ. Bot. 1873, p. 127); notes on the species are now given.

Plate 1.—Fig. 1.—*Agaricus* (*Amanita*) *Aureola*, Kalchbr. This is evidently a mere variety or very close ally of *A. muscarius*, L., the orange tint beneath the cuticle reminds one strongly of this species, and the size of the spores is the same. However this may be, *A.*

Aureola, K., is a British plant, and has been exhibited at South Kensington as a mere yellow-topped variety of *A. muscarius*, L.

Plate 1.—Fig. 2. *A. (Am.) cygnea*, Sch. if not one of the many varieties of *A. vaginatus*, Bull, is an unpleasantly near ally; according to the measurements given the latter plant has spores somewhat longer than *A. cygnea*.

Pl. 2.—Fig. 1. *A.* (*Lepiota*) *nympharum*, Kalchbr. This plant is one of the set coming close to *A. excoriatus*, Schæff., and as there is every intermediate form between the latter plant and *A. rachodes*, Vitt., and *A. procerus*, Scop., of which we have no doubt *A. nympharum*, K., to be one, we imagine little is gained by elevating it to the dignity of a species. The spores are said to be "*mediocres*," which is indefinite, and we take the plant itself to be the same type.

Pl. 2.—Fig. 2. *A.* (*Lep.*) *Schulzeri*, Fr. On the plate this is given as Fries's species, but in the letterpress Kalchbrenner's. It is closely allied to *A. holosericeus*, Fr., but is probably distinct, though the spores are the same; we find the latter plant with a hollow stem as in *A. Schulzeri*, though Fries describes it as solid.

Pl. 3.—*A.* (*Tricholoma*) *macrocephalus*, Sch. This has been published as a British plant, but Fries says it has been previously published by Lasch, No. 240. (See "Linnæa" iii. (1828), p. 396.)

Pl. 3. Fig. —*A.* (*Tr.*) *psammopus*, Kalch. A close ally of *A. saponaceus*, Tr., of which it may be a new form.

Pl. 4. Fig. 1.—*A.* (*Tr.*) *argyrius*, Kalch. A close ally of *A. terreus*, Schæff., of which it may be a mere form.

Pl. 4. Fig. 2.—*A.* (*Tr.*) *Centurio*, Kalch. This is probably the fleshy, dark-topped variety of *A. grammopodius*, Bull.

Pl. 5. *A.* (*Tr.*) *tumulosus*, Kalch., strongly reminds one of *A.* (*Clitocybe*) *fumosus*, P., var. *polius*; the habit is the same, so is the colour, and the larger section is that of a *Clitocybe*.

Pl. 6. Fig. 1.—*A.* (*Clitocybe*) *trullæformis*, Fr.
„ Fig. 2.—*A.* (*Collybia*) *atramentosus*, Kalch.
„ Fig. 3.—*A.* (*Coll.*) *plumipes*, Kalch.
„ Fig. 4.—*A.* (*Coll.*) *ranoidus*, Fr.

The first is a rare species, with which we are unacquainted, and the latter is a very common one; the two others are interesting as coming very close to *A. plexipes*, Fr., and *A. tenacellus*, P.

Pl. 7. Fig. 1.—*A.* (*Mycena*) *caesiellus*, Kalch. Too close to *A. purus*, P.

Pl. 7. Fig. 2.—*A.* (*Omphalia*) *cyanophyllus*, Fr.

Pl. 7. Fig. 3.—*A.* (*Omp.*) *reclinus*, Fr. In the descriptions the references are transposed.

Pl. 8. Fig. 1.—*A.* (*Pleurotus*) *sapidus*, Sch., allied to *A.* (*Pl.*) *petalodes*, Bull.

Pl. 8. Fig. 2.—*A.* (*Pl.*) *pardalis*, Sch.

Pl. 9. *A.* (*Pl.*) *superbiens*, Sch.

Pl. 10. Fig. 1.—*A.* (*Annularia*) *Fenzlii*, Sch. This plant looks very much like a *Bolbitius*, or still more a *Flammula*, as *A. flavidus*; this latter, like *A. Fenzlii*, Sch., is common on Limes. If its position be correct, it has no right to the subgeneric name of *Annularia*, as this position in *Agaricus* was pointed out and described by the writer of this notice under the name of *Chamæota*, in "Journal of Botany," vol. 8., p. 213. As Messrs. S. & K. refer to this article, their substitution of a mere MS. name is inexcusable.

Pl. 10. Fig. 2.—*A.* (*Pluteus*) *patricius*, Schul. A fine species apparently distinct from *A. cervinus*, Schæff.

WORTHINGTON G. SMITH.

Beskrifning öfver en ny art af slagtet Spirogyra. [Description of a New Species in the Genus Spirogyra.] BY O. NORDSTEDT.

Appended to the enumeration of the Norwegian *Desmidieæ*, noticed at p. 89, the author adds a description of a new species of *Spirogyra* :—

Spirogyra velata, n.s., Nordstedt.—Sterile cells with truncate ends, about 2-5 times longer than broad, chlorophyll-band single or rarely double, spores 2½-6. Zygospores ovoid, ordinarily twice as long as broad, furnished with 4 membranes, the first external, presently diffluent, the second colourless, hyaline, densely scrobiculate, the third smooth, chestnut-coloured. Sporiferous cells scarcely turgid, longer or shorter than the spores, not persistent. Germinating plant claviform, root-cell much elongate and attenuate, apical cell gradually attenuate, with obtuse apex. Breadth of cell 29-37 m.m.m. Breadth of zygospore 37-48 m.m.m.; its length 73-88 (—150) m.m.m.

The author points to this form being easily and certainly distinguished from all species hitherto described by its peculiar zygospore, surrounded by four membranes. In a number of *Spirogyra*-species it is the middle one of the three spore-membranes which is coloured, punctate or furnished with scrobiculæ, whilst in the species in question the middle brown and smooth membrane is surrounded by a white scrobiculate membrane like a veil ("slöja"). This colourless membrane is not the outermost one, first originating and quickly disappearing, for both can be seen at times simultaneously. The author brought home spores in the beginning of July, which germinated in autumn (Sept., Oct.). The membranes of the spore-bearing cells were constantly destroyed in the germination, so that the spores came to lie free. The young plants were club-shaped, but rather more attenuate towards the top than in *S. longata*, Auct., and this gradual attenuation towards the rounded extremities is retained and is very distinct in the first and all succeeding apical cells. No inconsiderable number of more or less abnormal zygospores were noticed constricted at the middle. W. ARCHER.

Botanical News.

ARTICLES IN JOURNALS.

Lens. (December, 1873).—H. L. Smith, "On Siliceous Shelled Bacillariæ or Diatomaceæ."—S. A. Briggs, "Diatomaceæ of the Baltic Sea" (transl. from Flögel. Tab. iv.).—H. H. Babcock, "Supplement to Flora of Chicago and vicinity."

Linnæa (Sept. 1873. T. xxxvii., pt. 6.)—O. Böckeler, "Cyperaceæ in Berlin Herbarium" (contd.).—(Dec. 1873. T. xxxviii., pt. 1.)—T. Wenzig, "Revision of Pomaceæ."—(January. T. xxxviii., pt. 2).—T. Wenzig, "Revision of Pomaceæ"(contd.).—E. Hampe, "New Mosses from Madagascar."—O. Bockeler, "Cyperaceæ of the Berlin Herbarium" (contd.).

Nuovo Giorn. Bot. Ital. (31 Jan.).—A. Gatta, "Lichenum Inferioris Italiæ Manipulus."—J. Tchistiakoff, "Development of Spores and Sporangia in Polypodiaceæ" (tab. 1).—"Review of Communications to Congresses of Italian Botanists" (contd.).

FEBRUARY.

Grevillea.—M. C. Cooke, "British Fungi" (contd.).—W. A. Leighton, "On the Gonidial Zoospores of Lichens."—W. Phillips, "*Thelocarpon intermediellum*, Nyl. in Britain."

Bull. Bot. Soc. France (t. xix., Session Extraordinaire, 1872).—C. Roumeguère, "Notice of Dr. J. L. Campanyo."—L. de Martin, "On Botanical Geography of the Mediterranean Region of France."—Unpublished Letters of Linnæus, Gouan, Lamarck, and Acharius to Lapeyrouse.—C. Royer, "On Sleep of Flowers."—Ib., "Similarity of young root in congeneric species."—D. Clos, "History of *Hyoscyamus albus* and *major*."—S. des Etangs, "Trifoliation of various opposite-leaved Plants."—M. Doumet Adanson, "Destruction of *Laricio*-forests in Corsica."—J. Duval-Jouve, "On a New Species of *Althenia*" (*A. Barrandonii*). — Husnot, "Bryology of Eastern Pyrenees."—Reports of the Excursions of the Society in E. Pyrenees.

Botanisker Notiser.—F. W. C. Areschong, "On the Anatomy of Leaves."

Bot. Zeitung.—A. de Bary. "*Protomyces microsporus* and its allies" (tab. 2).—E. V. Janczewski, "Growth of the Root-point in Phanerogams."—J. Wiénner, "Influence of Light on Chlorophyll."

Flora.—H. de Vries, "Review of Botanical Publications of Holland in 1873."—M. Treub, "On the Chlorophyll Question."—W. Nylander, "Animadversiones circa Spruce Lichenes Amazonicos et Andinos."—J. Weisner, "Amount of Chlorophyll in Aërial Organs of *Neottia Nidus-avis*."—F. Arnold, "Lichenological Fragments, xvi."—J. Müller, "On the Conditions of Validity in Systematic Nomenclature."

Oesterr. Bot. Zeitschr.—L. Celakovsky, "On the Genus *Trifolium*."—A. Kerner, "Distribution of Hungarian Plants" (contd.).—A. Val de Lièvre, "Notes on *Ranunculaceæ*, &c." (contd.).—W. C. Bochkoltz, "On *Scirpus supinus*."—J. L. Holuby, "Species of *Scleranthus*."—H. Kemp, "Supplement to Flora of Neighbourhood of Vorarlberg" (contd.).

New Books.—E. Morren, "Clusia; recueil d'observations de tératologie végétale" 1852—1874: Liège.—O. Brefeld, "Botanische

Untersuchungen über Schimmelpilze: Heft 2, Penicillium." Leipzig, 15s., 8 plates.

The *Nymphæaceæ* collected by the late Dr. Welwitsch in Angola form the subject of a monograph by Prof. Caspary, distinguished for his knowledge of that Order, published in the Lisbon "Jornal de Sciencias Mathematicas, Physicas e Naturas" for 1873, No. 16. The descriptions and synonymy are worked out in great detail, and transcripts of Dr. Welwitsch's elaborate descriptive notes to each specimen are added, with additional details by the author.

Pringsheim's "Jahrbücher für Wissenschaftliche Botanik" for 1873 contains three valuable memoirs. Pringsheim continues his important researches on the morphology and classification of the *Saprolegnieæ* (with 6 plates); Hildebrand contributes a paper on the anatomical structure and mechanism of elastic projectile fruits (with 3 plates), and Frank gives an account of the influence of light on the bilateral symmetry of the twigs in *Thuja occidentalis* (with one plate).

Mr. Sereno Watson has published in the Proceedings of the American Academy (vol. viii.), issued November, 1873, useful revisions of the extra-tropical North American species of the difficult genera *Lupinus*, *Potentilla* and *Œnothera*. In each we have a synopsis or clavis of species followed by detailed descriptions in English, whilst the synonymy, laboriously worked up, forms a sort of appendix with the species arranged alphabetically. The advantages of this new mode of arrangement are not obvious. The whole bears the evidences of thorough and satisfactory work. There are 56 species of *Lupinus*, 33 of *Potentilla*, and 68 of *Œnothera* enumerated; few new species are described and are more than compensated for by the reductions of others to synonyms or varieties.

"The Lens" is a Quarterly Journal of Microscopy and the allied natural sciences, published at Chicago. It is edited by S. A. Briggs, late President of the State Microscopical Society of Illinois. The third volume commenced with this year. Each number consists of seventy-six well-printed pages and occasional plates. Besides strictly microscopical matter this Journal contains articles on general botany. The subscription is three dollars annually; London agents, Trübner and Co.

The fourth Annual Report of the Wellington College Natural Science Society just issued contains a list of the plants of the neighbourhood of the College, including the additions, chiefly among the grasses, made during the past season.

In the Bulletin of the Torrey Botanical Club for December, 1873, Mr. W. R. Gerrard gives diagnoses of seven new species of Fungi, all from Poughkeepsie.

The Rev. J. E. Leefe has published the fourth fascicle of his "Salictum Exsiccatum." It contains the following examples of Willows:—80. *S. triandra*, Curt. (received from Woburn as *S. Richmondiana*). 81. *S. Helix*, E. Bot. 82. *S. nigricans*, Sm. 83. *S. bicolor*, Borr. 84. *S. aquatica*, Sm. 85. *S. nigricans*, Fr. 86. *S. Smithiana*, W. (non E. Bot.). 87. *S. Waldsteiniana*, Forbes (non Willd. Received from Woburn; appears to be only another form of *S. nigricans*, Fr.). 88. *S. phylicifolia*, L. 89. *S. ferruginea*, And.

(non E. B. 2665, nec Salict. Brit. Exsicc.). 90. *S. linearis*, Forbes (very closely allied to *S. incana*, Schrank). 91. *S. rupestris*, Don., Sm. 92. *S. holosericea*, Willd. (received from Woburn as *S. betulifolia*). 93. *S. nigricans*, Sm. 94. *S. hippophaëfolia*, Thuill. 95. *S. nigricans*., Fr. (leaves with oblique point). 96. *S. nigricans*, Fr., modificatio rotundifolia. 97. *S. Helix*, E. Bot. (received as *S. glauca*). 98. *S. subalpina*, Forbes. (received from Woburn, to which it was brought from Switzerland). 99. *S. Doniana*, Sm. 100. *S. phylicifolia*, L. (*bicolor*, Koch). 101. *S. Smithiana*, W. 102. *S. nigricans*, Fr. 103. *S. cinerea*, L. (*aquatica*, Sm.). 104. *S. nigricans*, Fr. 105. *S. triandra*, Curt.

Baron Von Müller has printed in the form of a small pamphlet his observations on a collection of plants made by Mr. F. A. Campbell in the New Hebrides and Loyalty Islands of the Pacific. The new species are *Pittosporum Campbelli*, New Hebrides, *Guillania novo-ebudica*, Santo, and *Gastrodia orobanchoides*, Eramanga.

We hear that a new (the seventh) edition of Prof. Babington's well-known "Manual of British Botany" is in the printer's hands and likely to appear very shortly. The author has bestowed his usual great pains in rendering the book complete up to date. As a field-companion the "Manual" is still without any formidable rival.

Professor Baillon's very valuable and useful "Monographies" continue steadily. The last part contains the *Saxifragaceæ* in which are included the *Platanea*, considered by the learned author as the most reduced type of the Order.

Mr. R. A. Pryor, of Hatfield, Herts, writes:—"A re-issue of the Supplements to the Herts Flora, with which will be combined the additional matter collected during the last few years, is in contemplation. I shall be very thankful for any information as to the segregates which have been brought into notice since that date, now almost twenty-five years back, of the original publication—of course for transmission to the Rev. R. H. Webb."

Mr. Nicholson, of Kew, has in preparation a Wild-Flora of Kew Gardens.

In the number for December last of the "Belgique Horticole" is an enumeration by Prof. Morren of the known species of the interesting genus of Orchids, *Masdevallia*. It is illustrated with three plates, one of which represents a new species *M. myriostigma*, Morren, found in Mexico by Mr. O. de Malzine.

Mr. James Collins, late of the Pharmaceutical Society, has requested us to state that all communications to him are to be addressed to "Perseverance Estate, Singapore."

The death is announced at Cordoba, on December 29th, of D. Josè Apolinario Nieto.

The great interest taken by the Fellows of the Linnean Society in its internal affairs was evidenced in a satisfactory manner on March 5th, when perhaps the largest meeting of the Society ever brought together attended at the invitation of the Council to consider "alterations in the bye-laws." The chair was occupied by Mr. Busk, F.R.S., one of the Vice-Presidents, who made a conciliatory speech, concluding with the suggestion, founded on a resolution of the Council, that a committee might be appointed by those Fellows who differed from the Council, to consider the bye-laws and to propose in writing such alterations as they thought desirable, and a promise that the Council would give their report its full consideration. Mr. Carruthers, on being appealed to, accordingly moved, "That a Committee be appointed to consider the bye-laws, and to suggest to the Council such alterations, omissions, and additions as they may think desirable;" and this was seconded by Mr. Dallas. Both proposer and seconder voluntarily and purposely abstained from any discussion on the points at issue, being anxious only to secure harmonious action between the parties in the Society. This reticence, however, there is good reason to believe, led some Fellows, who were unacquainted with the merits of the case, to suppose that the subjects of difference were of but slight importance, instead of affecting fundamentally the structure of the Society. Only in this way can we understand how it came to pass that an amendment embodying a less amicable course of action, which was proposed by General Strachey and seconded by Mr. Breese, was carried by fifty-seven votes against thirty-nine, a number of Fellows abstaining from voting. This was to the effect, "That inasmuch as it appears that there are differences of opinion in the Society as to the legality of the alterations of the bye-laws made at the meeting of the 15th January last: (1) This meeting, retaining complete confidence in the President and Council of the Society, request them to obtain the opinion of some legal authority whether those alterations are legally binding on the Society or not. (2) That if the opinion be that the said alterations are legally binding no further steps be taken in reference to them. (3) That if the opinion be that the said alterations, or any of them, are not legally binding, the Council be requested to take the necessary proceedings for setting aside the vote of the 15th January." The debate was throughout conducted with forbearance, the most curious point being that the alternative expressed in the amendment seemed to meet with the approval of the Chairman though it set aside the suggestion of the .Council which he had just read to the meeting, and which Mr. Carruthers' motion was intended to meet. We think the decision of the majority is to be regretted; it was made known to the meeting that the opinion of two legal authorities of eminence had been already taken as to the legality of the past proceedings, by certain Fellows for their private satisfaction, and that these opinions were at variance. Under these circumstances, which well illustrate the unsatisfactory character of legal opinions on matters of this kind, the Society might, we consider, have endeavoured to settle its own affairs within itself instead of officially appealing to the law. There can, however, be no reason why the minority at the last meeting should not still accept the Council's conciliatory offer and prepare for its consideration a well-considered and consistent scheme for placing the whole bye-laws once more in some intelligible harmony with the charter. The Council has promised to consider any such proposition, and for the sake of the future well-being of the Society, which the legal decision can in no way effect, we hope that some such action will be taken. The meeting did not separate till a resolution had been passed—proposed by Sir J. Lubbock, seconded by Mr. Carruthers—expressing the sense which the Society felt of the long and eminent services rendered to it by the late President, Mr. Bentham.

Original Articles.

A SKETCH OF THE LIFE OF WILLIAM SHERARD.

By B. Daydon Jackson, F.L.S.

> "Consul Gulielmus Sherardus, agnomine apud Botanicos Magnus, dum suam vitam, seipsum & omnia sua Rei Herbariæ consecravit, immortalem apud Botanicos obtinuit gloriam, quæ perennabit virens & florens dum vivent & florent plantæ."—*Linnæus, Hort. Cliff. dedic.*

The whole life of William Sherard was so intimately connected with that of the leading men of science in his day, that a comprehensive account of his career would be an epitome of his times. The exigencies of space, however, forbid more than a sketch of his life, designed to correct certain errors which appear in all the accounts that have come under my notice, apparently copied from one book to another, without reference to the sources of information, and to supply hitherto unpublished facts, which I have been fortunate enough to obtain. In addition to a careful collation of all printed materials within reach, most valuable information has been derived from the Sloane MSS. in the British Museum, which contain nearly eighty letters from Sherard himself, and many more from his contemporaries; from five volumes of letters to Sherard from his numerous friends, numbering about 620, preserved in the library of the Royal Society; and from the Sherardian collection, and the Register of Fellows of St. John's College, at Oxford. I have to thank the Rev. James Bellamy, D.D., president of the College, for his kindness in transcribing for my use all the passages in the College books relating to Sherard; Professor Lawson for facilities afforded for inspection of the Sherardian relics; and the Council of the Royal Society, for permitting me to peruse the above-mentioned correspondence.

William Sherard was born at Bushby, a small village in Leicestershire, on February 27, 1658-9, being the eldest son of George Sheerwood, or Sherwood, gentleman, by Mary, his second wife, both of whom died at an advanced age. John Ray at this time was thirty-one years old, and whilst Humanity Reader and Mathematical Lecturer at Trinity College, Cambridge, was diligently working at English Botany, and the first result appeared the following year, in the "Catalogus Plantarum circa Cantabrigiam nascentium." Sherard was educated at Merchant Taylors' School, and in 1677 was elected to St. John's College, Oxford, where he took his degree of B.C.L. on December 11, 1683. The same day appears an entry in the College Register to this effect: "Mr. Sherard obtained permission to travel beyond the seas for five years, the leave commencing from 22nd December." There is no record of when he became a Fellow; it may have been, and probably was, when he was elected, as the Law Fellows underwent no probation.

A book published in 1689, entitled "Schola Botanica," and which, in spite of some opinions to the contrary, is certainly from Sherard's pen, gives some incidental information as to his foreign occupations. We find by the preface that he passed the years 1686, 1687, and 1688 in Paris, where he studied botany under Tournefort, and that in the summer of the last year, he spent some time in Leyden with Hermann, who permitted him to make the freest use of his plants and manuscripts.

In November, 1689, he returned to England, and made a fresh application for leave of absence from his College. In the Register we read as follows:—"January 6, 1690. Mr. Sherard having returned before the completion of the five years, leave was granted him to travel again till he has completed the five years, provided he begin his journey within two months from this date." May 17, of the same year, however, found him still in London, whence he writes to Dr. Richardson, of North Bierley, in Yorkshire, "Mr. Ray's 'Synopsis' came out yesterday." It is probable that this was the attraction which kept him in England, it being a well-known fact that the printing was protracted. The same letter states that, "Dr. Plukenet has the promise of the place at the King's Garden. If so, I believe I shall go into Ireland with Sir Arthur Rawdon within this two months." This gentleman was then nineteen years of age, and had been sickly in his boyhood; probably Sherard was engaged in the double capacity of tutor and friend, the latter afterwards looked upon his stay at Moira, County Down, as more than three years wasted, besides £180 lent to Sir Arthur, which remained unpaid so late as 1717. Early in 1694, he must have been back in England, since he communicated a list of Continental plants to Ray's "Stirpium extra Britannias Sylloge," which could not be inserted in the proper place, on account of the contributor's absence in Ireland.

He proceeded to the degree of D.C.L. on June 23, 1694, and on the 13th of the following month occurs this entry in the College Register, from which we have already quoted:—

"July 13, 1694. Whereas the Lord Bp. of Winton* hath interpreted the statute concerning the five years of leave granted to Travellers, and given his opinion that another five years may be allowed to the same Person, and accordingly a second five years after y^e^ expiration of the former leave has been granted to Dr. Sherard, it is agreed that the remaining part of y^e^ second five years be granted him to travel, he undertaking to fulfil all the conditions required by the statute, and particularly to return at the expiration of the five years, Provided that he begin his journey by the end of August next."

It was possibly about this time that he made a tour on the Continent as tutor to Charles, Viscount Townsend; at least I am not in a position to confirm or deny Pulteney's statement (Sketches, vol. ii.,

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* Dr. Peter Mews, Bishop of Bath and Wells 1672—1684, whence he was translated to Winchester, which he held till 1706. He, also, was educated at Merchant Taylors' and St. John's, Oxford.

p. 141) on this head. In February, 1695, he was busily engaged on Hermann's MSS., which resulted in the publication of the "Paradisus Batavus," for the benefit of the widow of the deceased professor, the preface being dated April, 1697.

On June 13, 1695, Wriothesley, eldest son of Lord William Russell, who was executed in 1683, was created Baron Howland, on the occasion of his marriage, when fourteen years old, to one of the greatest heiresses of the time, the only daughter of John Howland, of Streatham, Esq., after which "he travelled into France and Italy." Sherard was the companion of this youthful bridegroom, and must have started even before the granting of the patent, to judge from the dates of certain letters from the Hague. One of these gives an instance of the help which Sherard freely rendered all his life to needy authors, enabling them to bring their works before the world. Speaking of a new work of Boccone's he says: "Had I not subscribed for 50 copies, and furnished him part of y^e money before hand, it had not been printed." After passing through Holland, we find Sherard at Rome in October, 1698, whence they travelled to Naples, and six months later they had arrived at Venice. A report of Tournefort's death greatly distressed Sherard, who hoped to visit his old preceptor and friend on their homeward journey: he did not discover the untruthfulness of the rumour for some time. The ensuing summer found him back in Rome; where he says, "my L^d is rec^d here wth all y^e hon^{rs} paid to souverain Princes, never any Englishman was so treated before, w^{ch} creates a great deal of trouble in receiving and paying formal visitts." His spare time was spent in searching for books wanted for himself and friends at home. Whilst staying in this city he seems to have first seriously contemplated what afterward became the dominant object of his life, namely, the continuation of Gaspard Bauhin's "Pinax" (1623), by the incorporation of all subsequent synonymy and discoveries, Tournefort being the instigator of the work.

The journey through France must have been rapid, since in September he writes from Paris, expecting to be home in three months time, in all likelihood he actually returned about the middle of December, 1699, having been absent more than three years. His pupil succeeded to his grandfather's title and estates, as second Duke of Bedford, in September, 1700. The dates here given do not correspond in all cases with those supplied by Pulteney and Smith, the latter in attempting to correct the former sometimes falls into equal error in an opposite direction.

In 1700 Sherard was appointed tutor to Henry, second Duke of Beaufort, who had in the previous year succeeded his grandfather in his title. His charge was amiable enough, but without the slightest liking for anything save "horses, dogs, and sport." Sherard stayed here about two years, until his Grace was eighteen, busy getting new seeds and plants for the garden, in which the Dowager Duchess took the keenest interest, and which then stood second to none in the kingdom, and helping Ray, now in a weak state of health, to revise his MSS. for the concluding volume of the "Historia Plantarum," to which he contributed "over a thousand plants." A part of his additions in his own handwriting is preserved in the Botanical Department of the British Museum.

The following year he went back to the beginning of his "Pinax," and somewhat altered the arrangement, having found the task grow so much under his hands as to compel him to enlarge his original plan. His duties at Badmington ended that autumn, upon which he came to London, and by the influence of friends, was given the post of Commissioner for the Sick and Wounded and for Exchange of Prisoners, together worth £300 per annum. He did not long retain this position, since about May, 1703, he was appointed Consul at Smyrna, and left England shortly after, as he thought, "probably for life," arriving at Constantinople the first week of November *en route* for his new sphere of action. His Fellowship had been forfeited the April preceding, through his having completely exhausted the patience of the College authorities by non-residence, as at that time the statute requiring continual residence was strictly enforced.

In consequence of the difficulty and risk of communication in those days, the letters throwing much light on his consular life are not very numerous. In 1705 he had been pleasantly employed on the "Pinax," but botanising he found difficult, "rogues swarming even up to the gates of Smirna, and no venturing but with a large party." Tournefort had warned him of this, and the prevalence of fevers and sickness, in words curiously like those just quoted. In the latter part of the summer of this year he visited the six other sister churches of Asia Minor, and copied many inscriptions, which were afterwards published by the Rev. Edmund Chishull, B.D., of Walthamstow, sometime chaplain at Smyrna.

During the whole of this time he was diligently acquiring coins for certain antiquarian friends at home, the Earl of Portland being one. Botanical work was still prosecuted, but with some difficulty, letters often taking *six months* in their transit from Smyrna to England, and shorter distances a proportionate time. On one occasion he lost £50 worth of books in a shipwrecked vessel, which loss it took more than a twelvemonth to replace. By May, 1711, he had worked up all his available materials, and was fairly at a standstill for want of books from Europe. About this time he bought a country house and garden attached, at Sedi-Keui, a small village seven miles E.S.E. from Smyrna, but according to his own account he seldom went thither. Forty years later Hasselquist visited the spot, but saw no trace of any care which might have been expended in laying out the garden. The same summer Sherard was able to take a journey, to which he had looked forward for some years, namely, by the sea coast to Halicarnasso, hoping to find a rich reward in many new plants. To his great disappointment, however, he brought back only about a dozen. The poor result from this trip, together with the difficulty of intercourse with other botanists, discouraged his ardour in this direction, and he actually decided to abandon the study, considering that for five-and-twenty years past he had contributed more growing plants and seeds to public and private gardens, than any other person whatever, and having been a drudge so long, he had fairly earned his quietus. He now turned his thoughts solely to antiquarian pursuits, and soon found he had expended more than £300 on coins; but in 1714 he lost upwards of 600 "medalls," which were stolen whilst he was at his country house, a loss which he could not hope to repair. His numismatic leaning thus checked, he again reverted to his old love, partly perhaps on hearing that his brother James, who was seven years his junior, had taken up "simpling." In March, 1714-5, Sherard writes to him, saying that he intends returning to Europe before long; that he is packing up his books, and cannot therefore intend staying long after their despatch, although he does not hope for a better position, or a more enjoyable climate in England than that at Smyrna, yet he longs for his brother's companionship, and finally begs him to get certain British plants from some old correspondents. In response to an application from the Royal Society, he sent a full account of the mode of inoculation for small-pox, as practised in the East. Abandoning a proposed journey to Libanus on account of his age, he quitted Smyrna either at the end of 1716 or the early part of the following year, after an official residence of thirteen years, being now fifty-six years old.

His intention was to proceed to London without delay, but an epidemic happening to break out on board the vessel which was conveying him, he was carried to Leghorn, there to undergo a tedious quarantine. These events induced him to spend the summer on the Continent, reaching Paris by September, whence he travelled to Holland, getting to London about Christmas time, 1717. Sir J. E. Smith states (Rees' Cyc., Art. Sherard) that on his return to England he was made LL.D., a title he certainly afterwards used (see list at end), but of this we can find no confirmation. In all probability it was the form then used for his degree of D.C.L., which he took, as we have seen, twenty-five years earlier.

The remaining portion of his life was spent in complete devotion to his cherished pursuits, and in constant correspondence with his very large circle of friends. He was elected F.R.S. in 1718, and his name appears on the Council list for 1719 and 1720. James Sherard had by this time amassed a considerable fortune, and was thinking of gradually withdrawing from business cares; it was not long after that he settled upon Eltham, as the most desirable part for his country residence, and purchased the manors of Evington and Settle, in his native county of Leicester.

By the month of March, 1721, William Sherard had resolved to bring in the skill of the celebrated German botanist Dillenius (who after publishing his first book, had been compelled to relinquish botany, and resume the practice of medicine for his livelihood), to help in perfecting the "Pinax," the *magnum opus* of his life.

In May therefore he started for the Continent, and visited Vaillant at Paris, who, completely worn out by his indefatigable labours, was rapidly sinking, and in a pitiable state of distress, fearing lest his labours should never see the light, and the fruit of thirty-six years' toil be lost. Sherard induced Boerhaave to purchase the MSS. and Aubriet's drawings, thereby bringing comfort to the dying Vaillant, who quietly passed away in the following year, with a mind completely set at rest. Continuing his journey, Sherard was mistaken by a peasant for a wolf, as he was creeping on the Alps in search for plants, and narrowly escaped being shot. He returned to England in September, bringing Dillenius with him; the "Pinax" was, however, impeded by a misunderstanding between Sir Hans Sloane and Sherard with regard to the use by the latter of certain collections made by Plukenet and Petiver. Dillenius however found scope for his acquirements, by editing a new edition of Ray's "Synopsis," working upon it early and late, and only interrupted by having to make drawings of the various plants which came into flower at the Eltham garden, and occasionally taking a day to hunt for mosses and Fungi. The Eltham establishment was now "superior in many respects to the King's Garden at Paris," and was unequalled as a private garden anywhere; later on, plants were freely contributed from it to Leyden, and other public institutions.

Sherard for a few years after his return from Smyrna lived in lodgings in Barking Alley, overlooking the graveyard of the Church of All Hallows, Barking; and although unwell during the summer of 1722, he was able to work assiduously at the "Pinax." At the end of May 1723, he started for Holland, intending to buy Kiggelaer's Herbarium, which he found not worth to him the price demanded; he spent some time with Boerhaave at Leyden, determining the plants of the "Index Plantarum quæ Lugd. Bat. aluntur" for his "Pinax;" and inspecting the drawings and descriptions for Vaillant's "Botanicon Parisiense," the arduous task of reducing which into order for publication devolved upon Boerhaave. The next year witnessed the publication of the third edition of Ray's "Synopsis," edited by Dillenius, and in a postscript Sherard tells Richardson (April 25, 1724):—"Dr. Boerhaave has printed Vaillant's 'Botanicum Parisiense'; that is the Catalogue he used to carry out with him; and designs to publish his criticisms, &c., with noble cuts, in folio. The occasion is, young Dr. Jussieu was putting out a new edition of Tournefort's 'Plants about Paris,' and his brother having had a copy of Vaillant's, it is thought he will give the additions as his own, to prevent which the Doctor has published this as a 'Prodromus.'" In the autumn of 1724 Sherard took a house on Tower Hill, at the corner of Barking Alley, a few doors from his old quarters, hoping by having more room at his command to be able to arrange his collection in better form. About this time the coolness between Sherard and Sir Hans Sloane ended in an open rupture, which stopped the adjustment of some of Petiver's and Plukenet's synonyms for the "Pinax." In August 1726 Sherard "gave £500 towards enlarging the Conservatory at Oxford"; "also a great number of curious Plants, and a Botanic Library of Books" (probably his duplicates), having previously visited the place and prevailed upon the authorities to provide better accommodation, upon the promise on his part to bequeath his Library and Herbarium Another flying visit to Holland, and the last, was made in the middle. of 1727. December of the same year witnessed the reconciliation of Sherard and Sloane. On the death of Sir Isaac Newton, Mr. Martin Folkes was proposed as President, but Sherard exerted himself actively on behalf of his quondam associate, who was ultimately elected to the Presidential chair, which he occupied for nine years. This behaviour of Sherard resulted in the Sloane Herbaria being lent to him, who was still engaged on the work begun twenty-eight years before, although by this time his health forbade him to expect to see the completion of his toil.

The closing scene of Sherard's active life can be best described by the following extract from a letter written by Dillenius to Dr. Richardson, dated August 13, 1728:—

"When the Consul lay at Eltham, I was obliged to be often there, . . . but since he came to town, I stayed with him, and attended him continually to the last moment he dyed, which happened last Saturday, between one and two in the morning, of a marasmus. He is to be buried next Monday at Eltham, from his house here [Tower Hill]. He has settled all his affairs, and left his collection to the University of Oxford, if they pleased to find a sum for the garden in six months' time: if not, the executors, Mr. James Sherard and Sir Richard Hopkins" [his brother and nephew], "are to take care and find a place for it. He hath been so kind as to nominate me his first Professor for lifetime, and to enjoy the yearly revenue from now, in order to take care of the Collection, and to carry on and finish his 'Pinax.'"

This letter was written the Monday following his death, which took place, according to the newspapers of the time, early on *Sunday*, 11th August. No doubt to the anxious watcher the early morning of that day would seem more like Saturday night. The date given in Rees' Cyclop. and Pulteney's "Sketches," vol. ii., p. 149 (August 12), is clearly wrong. He was buried in Eltham churchyard, on Monday, August 19, in the spot where he himself wished, and which had been chosen by James Sherard for his own grave, without a single line to mark the place where his ashes rest.

Sherard's will, made in the preceding April, and proved "*primo die mensis Augusti*" according to the date on the instrument, besides the bequests mentioned in the extract just given and sundry gifts to his relations, mentions bequests of "£100 and his silver watch to Dillenius, and £150, household furniture, and other effects, to his housekeeper, Mary Alanson."

During the delay which occurred before these intentions of Sherard could be carried out, Dillenius was commissioned by James Sherard to write the "Hortus Elthamensis." Time was thus taken up which might have been occupied on the materials amassed by the deceased botanist; and the result was that the "Pinax," though mentioned many times in the correspondence of the next few years still remained unfinished at the death of Dillenius in 1747. The MS. is preserved at Oxford, and consists of 126 parts, varying in thickness; in one case as many as thirteen sheets of extra paper were inserted at various periods during the progress of the work. Dillenius made use of a portion in preparing his "Historia Muscorum." In the Sherardian Library of more than six hundred volumes, are copies of Bauhin's "Pinax," 1623 and 1671; a third copy of the latter edition being interleaved and bound in two volumes, with abundant additional notes, and was probably the early attempt, mentioned at p. 131. His books are singularly clean and free from notes, a marked exception being a copy of Joncquet's "Hortus Regius," which may have served as groundwork for the "Schola Botanica." Amongst the rarities must be reckoned a superb copy of Rudbeck's "Campi Elysii," the first book, without colophon, but probably the most complete copy extant. Linnæus remarks of this work that scarcely ten copies of the second book, and only three of the first escaped the conflagration at Upsal, which destroyed the impression, and most of the woodblocks for it. Pritzel's description (n. 8825, ed. i.) was taken from this copy.

Sherard occupied a high place amongst the Botanists of his time; his intercourse with the leading men in the science, both at home and abroad, was intimate and frequent; he was generous, even to excess, in distributing seeds and dried plants, an unfailing patron of deserving naturalists, and crowned his useful life by the bequest of his library and herbarium, the most authentic and one of the largest at the time, to the University of Oxford, with the endowment of £3000 for the Professor of Botany. Whilst we cannot admit him as the equal of his contemporaries Ray and Tournefort, who originated systems, yet the services he rendered to Botany, at a period termed by Linnæus "the Golden Age," must make his name as lasting as the Science.

He possessed a good knowledge for the time of cryptogamous plants, and the acuteness Dillenius displayed in this branch was a strong link of attachment between them.

The name *Sherardia* was given by three different botanists about the same time to very different plants: first by Vaillant, in 1718, to eight species which he separated from *Verbena*, but which Linnæus subsequently reunited to it; then by Pontedera, in the same year, to an exotic shrub, *Galenia africana*, Linn.; finally by Dillenius, in the appendix to the second edition of his "Catalogus circa Gissem" (1719). This was the genus adopted by Linnæus.

A list of the works he either wrote or edited, in part at least, may fitly close our sketch. We exclude those to which he merely contributed information, such as Ray's "Synopsis," and "Historia," as otherwise the list would be found to include almost every important work published during his middle life, his name being gratefully mentioned in the prefaces of a large number of books.

I. SCHOLA BOTANICA, sive Catalogus Plantarum, quas ab aliquot annis in Horto Regio Parisiensi studiosis indigitavit Vir clarissimus *Joseph Pitton Tournefort*, D.M., ut et *Pauli Hermanni* P.P. PARADISI BATAVI PRODROMUS, in quo plantæ rariores omnes, in Batavorum Hortis hactenus cultæ, & plurimam partem a nemine antea descriptæ, recensentur. Edente in lucem S.W.A. Amstelædami, apud Henricum Wetstemium, 1689. (Pritzel, ed. i., no. 10983; see also 4393.)

Four copies of this work are in the Library of the British Museum. In the copy formerly in the possession of Sir Joseph Banks, following p. 301 are two leaves which are not included in the pagination, and are absent from the other three copies. The first page of these interpolated leaves reads thus:—"SCHOLA BOTANICA, ut et PARADISI BATAVI PRODROMUS. In quibus recensentur plantæ omnes, quæ in Parisiensium, Londinensium, Batavorum, aliorumque celebrioribus Europæ Hortis coluntur. Edente in lucem SIMONE WARTONO Anglo. Amstelædami, apud Henricum Wetstemium, 1689." The work is described from this copy by Dryander in the Catalogue of the Banksian Library thus:—"S.W. (*Simon* WARTON) &c. (Cat., vol. 3, p. 106. London, 1797.)"

In the following year another work appeared upon the plants cultivated in the Leyden Garden, entitled:—"Floræ Lugduno-

Batavæ flores; sive enumeratio stirpium horti Lugduno-Batavi methodo naturæ vestigiis insistente dispositarum et anno 1689 in lectionibus expositarum a *Paulo Hermanno*, nunc vero primum in lucem editarum opera *Lotharii* ZUMBACH. Lugduni-Batavorum, 1690. (Pritzel, n. 4394.) In the list of authorities quoted by the author, are two as follows:—"*Parad Bat.* Pauli Hermanni Paradisi Batavi Prodromus. Editus in lucem a Simone Warthon Anglo." "*Schol. Bot. Paris. Turnef.* Schola Botanica Parisiensis Josephi Pitton Tournefort. Edita in lucem a Simone Warthon Anglo." *Note.*—The pseudonym has in the above been altered from *Warton* to Warthon.

Ray's Library was sold 11th March, 1707-8, when the work is described as "Sherrard's Schola Botanica, Amst., 1648" (the date is a misprint). M. Lautier, in a life of Tournefort, prefixed to the latter's "Voyage du Levant," Amst., 1718, says, speaking of the Paris Garden, "Un Sçavant Anglois, qui s'est donné le nom de *Simon Wharton*, en a publié une partie sous le titre de *Schola Botanica, sive Catalogus Plantarum, &c.* J'ai vû un Exemplaire de ce Livre, où M. de Tournefort a corrigé & ajouté plusieurs choses de sa propre main, & même il y a marqué, que le véritable nom de cet Anglois étoit *Guillaume Sherard.*"

After the death of Tournefort, the secretary of the Academy, Fontenelle, wrote an account of his life, and speaking of the works of the deceased systematist, he says:—"Schola Botanica," &c., 1699 (a reprint). "Un Anglois nommé Mr. Simon Warton, qui avoit étudié trois ans en Botanique au jardin du Roi sous M. de Tournefort, fit ce Catalogue des plantes qu'il y avoit vûës." (Eloge sur Tournefort, tome 1, p. 160. 1731.) Seguier, following Lauthier, writes thus:—"SHERARDUS [*Gulielmus*] Botanicorum Princeps vocatus Schola Botanica," &c. "Samuelis Whartoni nomine editus, illi tribuitur. Vid. Whartonum." (Bibl. Bot., p. 182.) "WHARTON [*Samuel*] vel potius Gulielmus SHERARDUS, Schola Botanica," &ç. (Id., p. 211.)

Haller follows in the list of authorities thus:—"S.W., sive SAMUELIS WHARTON, Schola Botanica. . . . Amsterdam, anno 1689, 12°*, 1691, 12°, 1699, 12°. "Alii G. Sherard tribuunt." (Bibl. Bot. i., 643.) "S. WHARTON edidit ex Schedis Hermanni sibi communicatis Leidæ anno 1689, 12°*. (Id. i., 637.)

Finally Sir James Edward Smith contributed the following in his article on Sherard in Rees' Cyclop., vol. xxxii.:—"He is universally believed to have been the author of a 12mo volume, entitled *Schola Botanica*, published at Amsterdam in 1689, and reprinted in 1691 and 1699. This is a systematic catalogue of the Paris Garden. Its preface, dated London, November, 1688, is signed S.W.A., which the French writers have interpreted Samuel Wharton, Anglus . . But as no one ever heard of such a botanist as Wharton, and the preface in question displays the objects and acquisitions of one of the first rank, who could certainly not long remain in obscurity, the above initials are presumed to mean William Sherard, to whom alone, indeed, with or without a signature, that preface could belong." S. (Sir James Edward Smith) in Rees' Cyclopædia. London: 1819. Vol. xxxii. Article, Sherard.

II. PARADISUS BATAVUS, continens plus centum plantas affabrè ære incisas & descriptionibus illustratas. Cui accessit Catalogus Plantarum quas pro tomis nondum editis, delineandas curaverat *Paulus Hermannus*, M.D., in Academia Lugduni-Batava nuper Medicinæ ac Botanices Professor. Opus posthumum. Lugduni-Batavorum, impensis Viduæ, apud *Abrahamum Elzevier*, Academiæ Typographum, 1697. Edited, and the Preface written, by William Sherard. This fact strengthens the argument, if it were needed, for his authorship of "Schola Botanica." (Pritzel, n. 4395.)

III. Botanicon Parisiense; ou dénombrement par ordre alphabétique des plantes qui se trouvent aux environs de Paris, &c. . . . par Feu M. Sebastien Vaillant. A Leide & à Amsterdam, 1727. Edited by *Herman Boerhaave*; for *William Sherard's* connection with this work *vide ante*. (Pritzel, n. 10622.) Note.—A smaller work entitled "Botanicon Parisiense, Operis majoris proditui Prodromus" (Pritzel 10621), was issued by Boerhaave, in 1723, who feared lest some of Vaillant's notes might be appropriated by *Bernard de Jussieu* in the second edition of Tournefort's "Histoire des Plantes." Paris, 1725. (Pritzel, n. 10384.) See p. 134.

IV. "The way of making several China Varnishes sent from the Jesuits in China to the Great Duke of Tuscany. Communicated by Dr. William Sherard." Phil. Trans., vol. xxii., p. 525 (1700). It has been suggested that the information was gained by the author whilst in Rome with his pupil, the Duke of Beaufort.

V. "An account of the strange effects of the Indian Varnish. Wrote by Dr. Joseph del Papa, physician to the Cardinal de Medices, at the desire of the Great Duke of Tuscany. Communicated by Dr. William Sherard." The writer's name is incorrectly spelled by Pulteney, vol. ii., p. 144, as *Passa*. Phil. Trans., vol. xxii., p. 947 (1701).

VI. "An account of a New Island raised near Sant' Erini in the Archipelago, being part of a letter to Mr. James Petiver, F.R.S., from Dr. W. Sherard, Consul at Smyrna." Date of writing July 24, 1707; the news came to Smyrna from the English Consul at Milo. Phil. Trans., vol. xxvi., p. 67 (1708). Reference given by Pulteney (vol. ii., p. 145) incorrectly as Phil. Tr., vol. xxii., p. 67.

VII. "An account of the Poyson Tree in New England. By the Honourable Paul Dudley, Esq., F.R.S. A farther account of the same tree. By William Sherard, LL.D., R S.S." Phil. Trans. vol. xxxi., p. 147 (1721).

ON THE ALOINA SECTION OF THE GENUS TORTULA.

By W. Mitten, A.L.S.

The discovery of *Tortula brevirostris* in Derbyshire makes a most interesting addition to the British Flora which thus includes all the known European species belonging to the small group named by C. Mueller *Aloina*. This group, consisting of the species just named, *T. brevirostris*, *T. rigida*, *T. ambigua* and *T. aloides*, all now well-known and established, is remarkable for the curious formation of the leaves, which by most of the older muscologists were supposed to be nerveless, although the nerve is now known to be present in all the species. The history of this group is full of interest to the British bryologist, for three of the species will, I trust, after the considerations I shall offer, be shown to have been first distinguished by our countrymen. That this circumstance has been so long overlooked is partly due to the great mistakes made in arranging their synonymy by the authors themselves, who probably but incompletely grasped the value of their distinctions, which we, profiting by their experience, as well as by their errors, are enabled more exactly to comprehend; and partly to another cause. The publication of the "Bryologia Europæa" of necessity compelled the authors of that work to do the best they could with cases in which the synonymy must have appeared inextricable, and obliged them to cut the knots they could not disentangle, eventually obtaining by the splendour of their additions to Bryology a general acceptance of their solution of the difficulties. A conspicuous instance of this is afforded by *T. ambigua* and by *T. brevirostris*, which last now stands in Schimper's "Synopsis" as *T. brevirostris*, Bruch et Schimper, a new creation, distinct from the original species so named by Hooker and Greville. Avoiding the confusion of the synonyms, which it must be remembered arose when the presence or supposed absence of the nerve in the leaf was a prime distinction, it is more easy to investigate the history of the group by commencing with the first known species *Bryum rigidum acaulon, antheris erectis cylindricis, foliis patentibus linearibus convexis rigidis*, Hudson, Fl. Ang., 477. This description exactly applies to *T. ambigua*, and to that alone, no other European species having an erect cylindrical capsule. It is the *Bryum rigidum* of Dickson, whose specimen marked by himself is by me; it is also Hedwig's *T. rigida*, St. Crypt, i., t. 25, who says, "certissimi facti sumus speciminibus ex Anglia acceptis," l.c., p. 67. But whether it is the *T. rigida* of the first edition of the "Muscologia Britannica" (1818) may be doubtful, for the capsule is figured too elliptic, and the operculum too short; indeed, it seems as if the drawing of the capsule had been influenced by "some specimens which we have received from Sweden" which "have the leaves so broadly ovate and obtuse as to be nearly rotundate, yet we do not think that they can be more than varieties" (Muscol. Brit., ed., i., p. 30). In this remark is clearly indicated the as yet latent *T. brevirostris*, which has its capsule nearly of the form figured in the tab. xii.; the possibility of a mistake of this kind being made is very easily accounted for, as all our four species were at that time included in the same. By the time, however, that the second edition of the "Muscologia" appeared, in 1827, we find that Hooker and Greville had already, in Brewster's "Journal of Science" (1824), distinguished from the original *T. rigida* two other species, their *T. enervis* and *T. brevirostris*, both figured in the supplementary tab. ii. of the "Muscologia." The first, *T. enervis*, is described with its operculum thus: "lid conico-acuminate, rather shorter than the oblong capsule," and with Sir W. Hooker's accustomed fidelity to nature, the figure gives a good representation of the operculum with its slender beak as usual in *T. aloides*, quite different from that of *T. rigida*, Schultz, to which *T. enervis* has always been referred.

The second species, *T. brevirostris*, may have been figured from the before-mentioned Swedish specimens, a portion of which I have; but the importance of the relative length of the operculum not being yet duly estimated, the description says: "lid conical, scarcely beaked, half the length of the oblong capsule" (Muscol. Brit., ed ii., p. 53). So that it would appear that a capsule of *T. rigida*, Schultz, was in view when the description was written, although the figure has the operculum properly only one third the length of the capsule. A similar error has occurred in the "Bryologia Europæa" (Barbula, tab. ii., *bis*), where in the otherwise beautiful figure of *T. brevirostris*, all the capsules with opercula have that part as well as the peristome represented as it is in *T. rigida*, Schultz, as may be seen by looking at the figure of that moss in tab. i., and the similarity of the error in the difference between the description and the figure is again observable in the description of the 'Bryologia" where the capsule is "oblonga erecta operculo triplo breviore," whilst it is figured equal in length to half the capsule; very different from Sir W. Hooker's figure in the "Muscologia," which faithfully represents the true species.

Mr. Holmes, to whom is due the credit of having restored to the British Flora this some-time lost moss, received his specimens from Mr. E. George, who gathered them on a wall at Buxton with mature fruit in August. He has zealously pursued the subject to its source, re-examined the specimens in Dr. Greville's Herbarium, and found the original specimens gathered near Edinburgh by Stewart to be really *T. brevirostris*, thus showing that Wilson must have been misled by the confusion of specimens of *T. rigida* Schultz with *T. brevirostris*, which would appear to have afterwards occurred in Dr. Greville's and possibly other Herbaria. In Drummond's "Musci Americani," vol. i., no. 136, very fine specimens of *T. brevirostris* only are preserved in a copy I received from Sir J. Richardson, but in another copy the greater portion of the specimens are *T. rigida*, Schultz, and Professor Blytt sent the same species in mixture under the name of *T. brevirostris*, from Christiania. It may be mentioned that *T. brevirostris* aud *T. rigida*, Schultz, are more like to each other than they are to *T. ambigua* or *T. aloides*, the distinction in the inflorescence having been more recently discovered.

Remembering that Hooker and Greville possessed the Swedish specimens, there cannot be the least doubt after looking at the figure in the "Muscologia," that they had the species we now call *T. brevi-*

rostris, in view as well as ourselves, and there is no necessity to follow Schimper and abrogate their claim to the discovery of the species, or to consider the "Bryologia Europæa" Moss a discovery of more recent date. Dr. Greville's specimens being in part *T. rigida*, Schultz, has also another bearing which must not be overlooked, for if Hooker and Greville mistook *T. rigida* Schultz for British examples of their *T. brevirostris*, it can hardly be possible to suppose that their *T. enervis* described and figured at the same time and place could be identically the same species, yet this supposition has been generally accepted!

Previous to the second edition of the "Muscologia," Schultz, in the "Nova Acta" (Bonn, 1823), had described and figured the species which he took for *T. rigida* and to which his name has since been appended, but which we now know was not identical with Hedwig's, nor does it agree with Hudson's description, for it has a capsule which always tapers towards its mouth. This species was not, therefore, an old species re-established, but in fact a new creation, distinct enough from the original *T. rigida*, and instead of having so long been left in the usurpation of the name of the original *T. rigida*, Huds., should, although Schultz did not himself quite clear his species from all danger of confusion with its allies, according to the usual course have been re-named *T. Schultzii*.

No further contribution to the history of these Mosses appears to have been made by the authors of the "Muscologia," the species being enumerated with the same names and characters in the second volume of Hooker's "British Flora," part i., published in 1833. In the "Bryologia Britannica" the nomenclature adopted in the "Bryologia Europæa" has replaced that of the "Muscologia," *T. enervis* and *T. rigida* being reduced to synonyms, whilst *T. brevirostris* is banished from Britain.

In 1863, Lindberg published his exhaustive review of the nomenclature of the European *Tortulæ* and *Trichostoma*, restoring to Hooker and Greville the first distinction of *T. brevirostris*, and changing the name of *T. rigida*, Schultz, to that of *T. stellata*, Schreber, Fl. Lips. (1771) thus distinguished:—"capsula oblonga, pectine spiralis; operculi cuspis capsula fere longior" a character which applies best to *T. aloides*, firstly, because it has the longest operculum; and secondly, because the slender calyptra which closely embraces the beak, and descends only to the base of the operculum, adheres to and generally falls off with it, and thus might have been overlooked by Schreber as the operculum only; in *T. rigida* of Schultz, the operculum is too short and the calyptra quite different; therefore it is impossible to agree with his observation, "E notis supra citatis"—referring to Schreber's description—"præclarum mihi est hanc speciem sed nullam affinem a Schrebero, l.c., descriptam esse. Illud nomen tandem specificum, *rigida*, non minus quam quatuor speciebus (*T. aloidis, ambiguæ, brevirostri*, et *stellatæ*) dátum, est maxime confusum et abusum ut e scientiis ejici optime debeat." To which it must be answered firstly, that Schreber's description indicates *T. aloides*; and secondly, that the terse and exact description of the original *T. rigida* by Hudson certainly never gave rise to the confusion made by those who came after him. It is noteworthy that Lindberg, so careful and exact

as he usually is, has referred the *T. rigida* of the "Muscologia," tab. 12, to *T. aloides* without any comment on the figure or description, both of which forbid it, if carefully examined.

DE NOVA *ASPLENII* SPECIE

SCRIBIT HENRICUS F. HANCE.

Asplenium (*Euasplenium*) *cœnobiale*, sp. nova:—rhizomate brevi paleis nigris setaceis vestito, stipitibus 2-5 poll. longis tenuibus angulato-subcompressis glaberrimis ebeneis nitidis inferne pilis glandulosis ferrugineis mox deciduis tectis, frondibus densis 2-4 pollicaribus membranaceis circumscriptione triangulari-lanceolatis acuminatis inferne bipinnatisectis superne pinnatisectis segmentis primariis sensim apicem versus decrescentibus approximatis petiolatis oblongis obtusiusculis patentibus infimis deflexis segmentis secundariis 3-7-jugis e basi cuneata obovatis vel oblongis obtusis inferioribus pinnatipartitis superioribus pinnatifidis v. dentatis, rachi per dimidiam longitudinem ebenea dehinc viridi haud elevato-costata, venis inconspicuis simpliciter furcatis marginem segmentorum vix non attingentibus, soris extremitates segmentorum secundariorum occupantibus 1-3-nis, indusiis latiusculis membranaceis margine repandulis pallidi virenti-brunescentibus in parenchyma haud productis, paraphysibus nullis.

In muro vetusto intra terminos magni monasterii, ad Ting ii shan, secus fluvium Si kiang s. West River, provinciæ Cantonensis, legg. Sampson et Hance, d. 17 Julii, 1872. (Exsicc. n. 17756.) Filix satis pulchra, ab *A. varianti*, Hook. & Grev., *A. pekinensi*, Hance (quæ ambo sub nomine *A. sepulchralis* perperam confudit beatus Hooker), itemque ab aliis ejusdem agminis speciebus, *A. fontano*, Bernh., *A. inciso*, Thunb., *A. lanceolato*, Huds., cet., jam, lamina frondis pyramidata* stipiteque ebeneo, primo obtutu optime distincta. A stirpe japonensi, *A. solido*, Kze., a clar. Baker primo comparata—utrum recte secusne nescio—quam vero posterius cum *A. sepulchrali* (nomen maximopere confusum, prorsus ambiguum, ac sane omni jure rejciendum !) potius jungendam censuit vir lectissimus, statura, stipitis colore, totaque frondis architectura penitus diversa. Hujus enim proxima necessitudo cum *A. laserpitiifolio*, Lam., et affinibus vix neganda; quam sententiam jam professus est cl. Kuhn, felicissimus pteridologus, si, ut opinor, hæc est *A. Wilfordii*, Mett.†

Oblata nunc occasione, hic animadvertere cupio genus *Hypolepidum*, quod in disponendis filicibus Hongkongensibus (Journ. Linn. Soc. Bot. xiii., 139) admisi, mihi nunc melius edocto minime conservandum videri. Nam, species occurrunt nonnullæ—v.c. *Hypolepis nuda*, Mett.—in quibus sori prorsus nudi, nec lobulo frondis mutato ac revoluto velati, inveniuntur, quæ tamen a genuinis nullo pacto segre-

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* Ambitu, minime tamen incisura, nostra non male refert *A. pinnatifidum*, Nutt.

† Conf. quæ de hisce alio loco jamdudum scripsi (Journ. Linn. Soc. xiii., 93).

gandæ sunt. Ita dilabitur primaria, vel potius quidem sola nota diagnostica; nec, profecto, a speciebus multis e grege *Aspidiorum* nudisororum a variis auctoribus inter *Phegopterides* collocatis, habitu omnino abhorrent *Hypolepides* in genere; juxta quas, igitur, me judice, stationem in systemate poscunt.[*] Genus *Athyrium*, quod, vestigia defuncti Mildei presso secutus gressu, restituendum credo, non tantum admisit nuperrimus Filicum classificator, cl. Bommer, sed etiam ab *Aspleniis* tribu ultro segregavit. Auctor iste, cæcus, ut crederem, in re critica, vel saltem luscus, in systemate plane proprio dignissimi Professoris Mettenii, pteridographorum procul dubio longe meritissimi ac peritissimi, nihil aliud invenit quam dispositionem bonis diagnosibus instructam ![†]

ON THE SYNONYMY OF THE NORTH AMERICAN SPECIES OF CHEILANTHES.

By J. G. Baker, F.L.S.

I have gone through Mr. Watt's notes on this matter, p. 47, with the following result. (It will be observed that he does not raise any question as to the limitation or alliance of the species, but simply as to the names which three plants admitted alike by Eaton, himself, and myself should bear.)

1. With reference to this it seems quite clear that, as he points out, the specific name *lanosa* has a year's priority over the received one of *vestita*. *Vestita* is the one that was first published under the genus *Cheilanthes*, but I think we are all pretty much agreed in ferns now to take up the oldest specific name independent of genus. If this be done my only hesitation in the matter arises from the fact that Mr. Moore (Index Filicum, p. 245) states that Michaux's synonym applies in part to Mr. Watt's third species, and calls that *Cheilanthes lanosa*, Moore. We have no type of Michaux's plant at Kew. If we call the present plant *lanosa* we must therefore write *C. lanosa*, Watt *non* Moore.

2. Here the question of name rests upon the point of whether the United States *Bradburii* be really identical with the plant described earlier by Link from the Berlin garden under the name of *tomentosa*. Kunze identified the two, and I have accepted the identification on his authority without ever having had a chance of verifying it upon authentic specimens on my own account. Of *Nothochlæna tomentosa* of Desvaux I know nothing except that it stands as a name without a country in Desvaux's Catalogue of 1827. We have

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[*] Cfr. Mettenius Fil. Hort. Bot. Lips., 80; ejusd. lib. *Phegopteris* 13. adn.; ejusd. Fil. ind. et iap. in Miq. Ann. Mus. Bot. L.-B. i., 221; Hook. fil. Handb. N. Zeal. Fl., 361, 881; Grisebach Fl. Br. W. Ind., 667; Kuhn Fil. Afric., 120. Qui *Hypolepidem* pro genere agnoscunt ii similem *Calymmodonti* dignitatem invita' tantum justitia denegent.

[†] "Cette classification est simplement réduite à de bonnes diagnoses.' (Bommer Monogr. de la classe des Fougères, 59.)

not John Smith's plant in cultivation at Kew now, but I expect the *Nothochlæna tomentosa* figured in Lowe's Ferns, vol. i., t. 15B, is this, and do not see from the plate any reason why it should not be identical with the States plant, and turning to Fournier's recent monograph of Mexican ferns do not find that he knows any *C. tomentosa* as a Mexican species. I incline still to follow Kunze unless Mr. Watt can show that he is wrong.

3. I am not aware of any publication of Mr. Watt's name *lanuginosa* earlier than 1864, whilst *gracilis* goes back, as Mr. Watt shows, to 1850-2. Riehl's publication is simply a set of specimens with printed tickets. We have one of the sets laid into the Kew Herbarium, but I do not find in it this *Cheilanthes*. At any rate Fée's figure is a very good one, and quite settles the question so far as the plant intended by him is concerned. There is an earlier *Cheilanthes gracilis* of Kaulfuss which is our *Pellæa Stelleri*. Probably it was on account of this that Eaton did not take up the name *gracilis*.

ON THE FLORA OF THE YORKSHIRE COALFIELD.

BY F. ARNOLD LEES, F.L.S.

THE difference between the flora of the district overlying the coal measures of Yorkshire and that of the adjacent millstone grit tract is not very great. It is not so much a difference in kind as (so to say) of degree. Many of the species found upon the grit-stone are thinned out; that is, all are more conspicuous by their absence than by their presence; and others which might be considered characteristic of the argillaceous shales of the coal beds, as certain species are of the limestones and sandstones, do *not* supply their place.

If any plants seem to flourish with compensating luxuriance in an attempt to hide the ugly blue-grey and dripping ledges of shale, the thin-cropped fields, and the ubiquitous railway embankments of the country included within the towns of Bradford, Halifax, Huddersfield, Barnsley, Normanton and Leeds, they are the Charlock, *Heracleum*, *Tussilago*, Ragwort, *Hieracium boreale*, Foxglove, *Linaria vulgaris*, and *Equisetum arvense*, with *Convolvulus arvensis* (in parts) in the open; *Tanacetum*, *Petasites* and Alder by the slower river banks; and in the woodlands *Lychnis diurna*, *Allium ursinum*, the Hyacinth and *Pteris* for a carpet, Birch and stunted Oak for the shelter, and unfruiting Hazel for the undergrowth.

Water plants are naturally but little affected by the conditions determining the variety of land ones, so that we find over the Yorkshire Coalfield the paucity of hygrophilous species not quite so noticeable. Many familiar ones, of the lowland rural districts, amongst these are no doubt wanting, and such as *Hydrocharis* have always been so; but a consideration of levels will partly explain the absence of these; whilst a still greater number (especially such as love clear water) have been eradicated within a comparatively recent period, much in the same way as the trout and pike, through the multiplication of factories, dye-houses, tanneries and bleach works, poisoning their element with dyestuffs, tanpit refuse, chloride of lime, &c. Still I see no reason for doubting that many of the present absentees—the batrachian *Ranunculi*, the Water-Lilies, *Cerastium aquaticum*, the *Siums*, *Helosciadiums*, and *Œnanthe fistulosa*, *Bidens cernua*, *Lysimachia thyrsiflora*, *Iris Pseudacorus*, and perhaps *Symphytum officinale*, for instance—did exist indigenous before commercial industry came to destroy them, and one or two of those species named probably survive in some solitary corners still. I know more than one spot where *Butomus* and *Iris* existed up to within a very few years, but have now completely disappeared. Yet some noteworthy ones remain even yet. The handsome *Sagittaria*, *Alisma Plantago*, *Lycopus*, *Carex acuta* and *Acorus* (this last probably introduced, but now flourishing) may be found fringing many of the inky rivers and canals of the coal country; and *Hippuris*, *Ceratophyllum*, *Potamogeton pusillus* linger here and there in mill-dams and reservoirs, with plenty of *Sparganium*, *Veronica Beccabunga*, and *Mentha aquatica* in water cuts and ditches.

Throughout the coalfield area there is a woeful dearth of Orchids—such common ones as *Listera ovata*, and *Orchis mascula* are almost unknown, and even *O. maculata* is rare. The Snowdrop and the Daffodil occur in a few woods where they have been planted, but are quite Aliens in the district, and in the opinion of many competent observers in the flagstone tracts about Bradford and Halifax too: the plants are of the double or garden form, and not of the depauperate wild one.

The plants enumerated can hardly be called distinctive, seeing that they equally occur on the gritstone, most of them, perhaps the Foxglove least, on the limestone as well; and I am not aware of a single species, even an accidental rare one, which is found only on the carboniferous strata of our coalfield. A more uninteresting botanically-barren district, for lack of any but the commonest and hardiest plants, it would be difficult to point out. On the gritstone high lands, sameness of vegetation though there be, a clear bracing atmosphere around, and a springy turf underfoot are encountered: on the coal measures little enough of either. In brief, the coalfield flora may fairly be said to consist of the same plants as occur on the gritstone, minus fully a third, and these the less universally distributed species.

As to the reasons for this, and for the floras of the limestones, I quite think with Dr. Willis (p. 11) that the differences mainly depend upon the physical peculiarities of the surface soils resulting from the mechanical constitution of the strata beneath, whilst still believing that some few (though not nearly all of the xerophilous class) have a preference for lime; if not for silicates or carbon, in the soil, as a chemical necessity of existence. I think a brief consideration of the kind and properties of the various rocks will show this.

The calcareous tract to the east is formed by the Permian magnesian beds composed of hard nodules interlayered with friable marls, non-absorbent, retaining moisture only in a small degree, but allowing it to run off quickly; and having in consequence a warm, dry, rich soil above it, in which flourishes the richest flora of any West Yorkshire district.

The north-western hill country of Craven is made up of the Yoredale and Scar-limestone strata, *dysgeogenous* (to borrow Thurmann's convenient term, used by Mr. Baker in his "North Yorkshire") in a less degree than the last, compact and non-absorbent, yet permeable in mass because honeycombed with holes and fissures, leaving the soil above it light, warm and dry. Its flora is very rich too, though partly through the accident of presenting altitude enough for many xerophilous plants with a montane restriction.

Between these two formations as to geographical position, north of the coal district, the great masses of gritstone are at the surface, occupying an intermediate place as to porosity and absorbent quality between the mountain-limestone and the coal shale; with a flora from which certain of the limestone species have been cut off, but replaced in part by others, such as the Rowan tree, *Geranium pratense*, *Myrrhis*, Foxglove, the Heather, and numerous Ferns, flourishing with such peculiar vigour as to constitute them characteristic plants. This gritstone rock is *eugeogenous*, but varies somewhat in quality and behaviour under disintegrating influences. In the part north of the Aire to Brimham, where it forms compact masses, it is less absorbent, and has a drier, sandier soil above it (in which the Beech and Elm, and Scotch Fir flourish well) than in the southern half where the flagstone predominates, and a colder more humid soil obtains, with a poorer flora and more stunted vegetation, in which Fir, Beech and Elm do not succeed.

Lastly, as the surface rock of the coal measures we have the shales and clays of various constitution, but all of them very absorbent, and superimposed in such a way that water percolates through them the least readily; and being retained results in a cold, heavy, wet soil, with the most meagre flora of any part of the Riding.

We have, then, over the coalfield tract all the lithological characteristics tending to restriction of species intensified to the most extreme degree, thus alone accounting in great part for the corresponding reduction in the variety of plant life. I have limited myself to consideration of phanerogamic forms, of course; for with a far greater majority of the lower ones, Mosses, Lichens, &c., damp is an essential of healthy life, and consequently these are in great abundance in the gritstone and coalfield glens, and comparatively fewer both in species and individuals in the dry calcareous districts. We thus see that the plants (flowering and flowerless) of the coal districts, are such as prefer, or are most indifferent to, cold and damp shade, and heavy wet soil.

RECENT ADDITIONS TO THE BRITISH LICHEN FLORA.

BY THE REV. J. M. CROMBIE, F.L.S., &c.

IV.

In addition to those recorded in this Journal, 1873, p. 132, as having been detected in Great Britain since the publication of Mr. Leighton's Lichen-Flora, the following species and varieties, amongst several other new ones not yet described, have now to be recorded.

1. *Collemopsis Flotoviana* (Hepp. Flecht., No. 92). On chalk pebbles in a pit near Gomshall, in Surrey, sparingly (Crombie); closely allied

to, if in reality distinct from, *C. Schæreri* (Mass), with which it was associated.

2. *Collema myriococcum*, Ach. Syn., p. 316. Amongst mosses on old walls in various places about Cirencester (Wm. Joshua); common, but with the apothecia seldom well developed.

3. *C. pulposum*, var. *pulposulum*, Nyl. Ægypt., p. 1. On the canal wall at Cirencester (Joshua); probably to be detected elsewhere.

4. *C. cheileum*, var. *monocarpon*, Duf. in Nyl. Syn., p. 111. On earth of old walls near Cirencester (Joshua); the specimens seem sufficiently typical.

5. *C. subplicatile*, Nyl. in Flora, 1873, p. 364, *nomen* (not *C. plicatile*, Arn). On the top of a wall, Appin, Argyleshire (Crombie); sparingly gathered, but perhaps not rare in similar districts.

6. *Ramalina scopulorum*, var. *incrassata*, Nyl. Ramal., p. 59. On maritime rocks, Jersey (Larbalestier); no doubt to be detected on other of our rocky coasts.

7. *R. cuspidata*, var. *crassa* (Del.), Nyl. Ramal., p. 61. On maritime rocks near Penzance (Curnow); and at Jersey (Larbalestier).

8. *Nephromium subtomne'ellum*, Nyl. Lapp. Or., p. 116. On the trunks of old ash-trees at head of Loch Awe, Argyleshire (Crombie); probably to be regarded as a distinct species from *N. lævigatum*.

9. *Peltigera malacea* (Ach. Syn., p. 240). Amongst mosses on the trunks of old trees at Inverary, Argyleshire (Crombie, August, 1873); perhaps not uncommon in the S. W. Highlands and other mountainous tracts in the W. of Britain.

10. *Solorina bispora*, Nyl. Syn., p. 331. On earth in the crevices of rocks, Ben Lawers (Dr. Stirton); but probably not a distinct species from *S. saccata*, var. *limbata*, Smmrft.

11. *Squamaria saxicola* * *albo marginata*, Nyl. in Sällsk. pro F. et H. F. Not. xi., p. 181. On decayed mosses upon a wall near Lewes, Sussex (Crombie); sparingly gathered, but no doubt to be detected elsewhere; perhaps a distinct species.

12. *Placodium cirrochroum* (Ach. Syn., p. 181). On limestone walls near Stavely, Westmoreland (Martindale); not very rare, but always infertile.

13. *P. Agardhianum*, Hepp Flecht., No. 407. On rocks, Llanymynech Hill, Shropshire (Leighton), and on walls near Cirencester (Joshua).

14. *Lecanora discolorans*, Nyl. in Flora, 1868, p. 347 (*Lecidea discolor*, Hepp Flecht., No. 319). On clay slate walls near Stavely, Kendal (Martindale).

15. *L. milvina* (Whlnb. in Ach. Meth. Suppl., p. 34). On rocks, Vale Castle, Guernsey (Larbalestier), and near Penzance, Cornwall (Curnow); no doubt also on other of our rocky coasts, being probably overlooked as a state of *L. sophodes* or *exigua*.

16. *L. torquata* (Fr. S. O. V., p. 284). On maritime rocks, Alderney (Larbalestier); and like the preceding probably to be detected elsewhere in similar habitats; not to be confounded with *Lecidea rivulosa*, which at first sight it somewhat resembles.

17. *L. fugiens*, Nyl. in Flora, 1873, p. 289, *sp.n.* On dry maritime rocks at Rozel, Jersey (Larbalestier). N. B. *L. actæa*, Nyl., l.c., p. 290, is only a young state of *L. Ralfsii* (Salw.); *fide* Nyl. in litt.

18. *L. spodophæiza*, Nyl. in Flora, 1873, p. 290, *sp.n.* On granite rocks, Mont Orgueil, Jersey (Larbalestier); not unlike some states of *L. spodophæa*, Whlnb., but belonging to the section of *L. erysibe*.

19. *L. lactea* (Mass. Symm., p. 26, *sub Aspicilia*). On walls near Cirencester (Joshua); not uncommon, but with thallus rarely well developed, closely allied to *L. erysibe*.

20. *L. chlorophæodes*, Nyl. in Flora, 1873, p. 290. On rocks, Vale Castle, Guernsey (Labalestier); allied to *subventosa*, but differing in the colour of the thallus and of the apothecia, in the shorter spermatia and other characters.

21. *L. umbrina* * *Zosteræ* (Ach. Syn., p. 158). On the dried leaves of *Zostera marina* at La Moye, Jersey (Larbalestier); referable to this species, and not as formerly regarded a var of *L. subfusca*.

22. *Pertusaria urceolata*, Nyl. Pyren. Or., p. 70, *sp.n.* On walls at La Moye, Jersey (Larbalestier); very sparingly.

23. *Lecidea atro-purpurascens*, Nyl. in Flora, 1873, p. 294, *sp.n.* On the bark of an old oak near Lyndhurst, in the New Forest (Crombie); apparently extremely rare, only a single specimen having been gathered; and subsequently sought for in vain in that neighbourhood.

24. *L. subsphæroides*, Nyl. in Flora, 1873, p. 294, *sp.n.* On a young beech tree near Lyndhurst in the New Forest (Crombie); very sparingly.

25. *L. perobscura*, Nyl. in Flora, 1874, p. 9, *sp.n.* On old pales near Killin, Perthshire (Crombie); and probably to be detected elsewhere in the Highlands.

26. *L. spodiza*, Nyl. in Flora, 1874, p. 9, *sp.n.* On old fir pales near Killin, Perthshire (Crombie); a species allied to *L. denigrata* and *L. spododes*.

27. *L. hemipolioides*, Nyl. in Flora, 1873, p. 294, *sp.n.* On rocks at Rozel, Jersey (Larbalestier); allied to *L. arcentina* * *hemipolia*, Nyl.

28. *L. carneo-glauca*, Nyl. in Flora, 1873, p. 295, *sp.n.* On siliceous rocks at Rozel, Jersey (Larbalestier); very rare, and only a single specimen with apothecia gathered.

29. *L. herbarum* (Hepp, Stiz., *Lecid. nadelf.*, p. 46). On the ground amongst rocks in a ravine at Sark (Larbalestier); rare.

30. *L. subincompta* * *oribata*, Nyl. in Flora, 1874, p. 16, *subsp.n.* On schistose soil of Ben Lawers (Dr. Stirton).

31. *L. Walrothii* (Tul. sub *Scutula*), Nyl. Lapp. Or., p. 150. On the thallus of *Solorina saccata* passing into *f. limbata* in Glen Lyon, Perthshire (Crombie). Is *L. epiphorbia*, Stn , referable to this or to *L. Heerii*, Hepp., as his brief description rather imports?

32. *L. botryiza*, Nyl. in Flora, 1874, p. 10, *sp.n.* On schistose soil of Ben Voirlich, Perthshire (Dr. Stinton); allied to *L. botryocarpa*, Nyl.

33. *L. caligans*. Nyl. in Flora, 1874, p. 10., *sp.n.* On maritime rocks in the island of Alderney (Larbalestier); but very sparingly gathered.

34. *L. scotinodes*, Nyl. in Flora, 1873, p. 295, *sp.n.* On micaceous boulders of Craig Tulloch, Blair Athole (Crombie); rare, and only a single specimen met with.

35. *L. contiguella*, Nyl. in Flora, 1873, p. 295, *sp.n.* On quartzose

stones in gravelly places near the summit of Morrone, Braemar (Crombie), very sparingly gathered.

36. *L. confœderans*, Nyl. l.c., p. 296, *sp.n.* On bare exposed quartzose boulders of Morrone (Crombie); apparently a very distinct and beautiful species.

37. *L. sarcogynoides*, Hrb. S. L. G., p. 252. On granitic maritime rocks at La Moye, Jersey (Larbalestier), and no doubt to be detected elsewhere in Britain.

38. *L. deludens*, Nyl. in Flora, 1873, p. 295, *sp.n.* On quartzose stones on the summit of Cairn Gowar, Blair Athole (Crombie); extremely rare, allied to *L. colludens*, Nyl.

39. *L. subgyratula*, Nyl., l.c., *sp.n.* On stones amongst detritus near the summit of Morrone, Braemar (Crombie); allied to *L. nucleonatula.*

40. *L. æquata* (Ach. L.U., p. 171), Nyl. in Flora, 1868, p. 347. On maritime granite rocks near Penzance, Cornwall (Curnow); sparingly.

41. *L. persimilis*, Nyl. in Sällsk. pro F. et Fl. F. Not., n.s. i., p. 237. On *Jungermanniæ* upon Ben Lawers and at Canlochan, Forfarshire (Dr. Stirton).

42. *L. vernicoma*, Tuck. Enum. Lich. N. Amer., Suppl. i., p. 429. On stones, Fliquet Bay, and at La Moye, Jersey (Larbalestier); very closely allied to the saxicole state of *L. myriocarpa*, DC.

43. *L. delimis*, Nyl. in Flora, 1873, p. 297, *sp.n.* On granite at Mont Orgueil Castle, Jersey (Larbalestier); very rare.

44. *L. subviridis*, Nyl., l.c., *sp.n.* On siliceous rocks at Noirmont, Jersey (Larbalestier); belonging as it would appear to the section of *L. arthoniza.*

45. *L. lutulata*, Nyl., l.c., *sp.n.* On stones in Rozel meadow, Jersey (Larbalestier); sparingly gathered.

46. *L. affinis*, Schær., Enum., p. 132. On mosses at Morrone, Braemar (Crombie), and no doubt to be detected elsewhere in the Highlands; var. *melina* (Kphb.), Nyl. Nov. Gran. 2, p. 72. On mosses upon Ben Lawers (Dr. Stirton)=*Lecidea didymospora*, Strn.

47. *Arthonia astroidestera*, Nyl. in Flora, 1874, p. 13, *sp.n.* On the bark of hollies near Lyndhurst, New Forest (Crombie and Larbalestier); but very sparingly,=*A. armoricana*, Cromb. Enum., p. 103, Leight. Lich. Fl., p. 401.

48. *Thelocarpon intermediellum*, Nyl. in Flora, 1865, p. 260. On old leather in a field near Shrewsbury, Shropshire (W. Phillips).

ESPÈCES NOUVELLES DU GENRE *DIPTEROCARPUS.*

Par M. Vesque.

(From the "Comptes Rendus," 1874, 2 Mars, tom. lxxviii., pp. 625-627.)

1. *D. fagineus.*—Ramosus, ramis ramulisque gracilibus cortice fusco vestitis, novellis velutinis; foliis ellipticis vel lanceolatis, acutis vel acuminatis, basi cuneatis, obscure sinuatis utrinque glabris, subtus costa petioloque pubescentibus; gemmis conicis parvis villosis; racemis axillaribus 3-floris; calycis fructiferi tubo pyriformi 5-costato, laciniis auctis lanceolato oblongis obtusis trinerviis.

Folia 6-9^{cm} longa, 3-4 lata, petiola 2^{cm} longa; calycis fructiferi

tubus 1·5-2^{cm} longus, 1·5 latus, laciniæ auctæ 6-8^{cm} longæ, 1·5-2^{cm} latæ.—Borneo (Beccari, no. 3008).

2. *D. stenopterus.*—Ramis gracilibus, novellis pubescenti-hirsutis, gemmis oblongis velutinis; foliis elliptico-lanceolatis acuminatis basi cuneatis vel rotundatis, supra lævibus subtus fuscescentibus glabris, petiolis villosis; racemis axillaribus 8-10-floris hirtis; calycis fructiferi tubo pruinoso fusiformi 5-costato, costis acutissima basi evanescentibus, laciniis auctis lineari-spathulatis vel lineari-oblongis trinerviis nervis basilaribus vix ad alam mediam evanidis.

Folia ad 20^{cm} longa, 7-8^{cm} lata; petiola 2-3^{cm} longa; calycis fructiferi tubus 2^{cm} longus, 8^{mm} latus, laciniæ auctæ 9^{cm} longæ.—Borneo (O. Beccari, no. 3762).

3. *D. nudus.*—Ramis gracilibus glaberrimis; foliis ellipticis vel obovato-ellipticis acutis basi attenuatis vel cuneato-rotundatis utrinque glaberrimis; petiolis lævibus ad limbum tumidis, racemis axillaribus et terminalibus ad 5-floris, calycis fructiferi tubo cylindrico 5-costato glaberrimo, costis plus minusve prominulis acutisque, laciniis auctis oblongis obtusis trinerviis.

Folia 12-14^{cm} longa, 5-7^{cm} lata; petiola, 3·5-4^{cm} lata, calycis fructiferi tubus 2·5-3^{cm} longus, 1-1·5^{cm} latus, laciniæ auctæ 9-10^{cm} longæ, 1·5^{cm} latæ.—Borneo (O. Beccari, no. 2905).

4. *D. acutangulus.*—Ramis glaberrimis gemmis conicis tantum hirsutis, foliis ovatis vel rotundatis obscure sinuato-crenatis plicatis, subtus nervulis tenuissimis transversis, petiolis glaberrimis, racemis axillaribus 3-4-floris; calycis fructiferi tubo 5-gono glaberrimo costis acutis, laciniis auctis lineari-oblongis trinerviis.

Folia ad 10^{cm} longa, 6-7^{cm} lata, petiola 3^{cm} longa; calycis fructiferi tubus 2^{cm} longus et latus, laciniæ auctæ 12-15^{cm} longæ, 3^{cm} latæ.—Borneo (O. Beccari, no. 2913).

5. *D. geniculatus.*—Ramis cortice cinereo lenticellisque oblongis verrucosis; foliis ellipticis vel obovatis obtusis, basi rotundatis vel subcordatis, supra glaberrimis, subtus ad costam tantum puberulis; petiolis glabris transverse fissis ad limbum geniculatis tumidis; gemmis cinereo-velutinis; racemis axillaribus 3-floris tomentoso-velutinis, calycis fructiferi tubo medio 5-costato costis lævibus vix prominulis; laciniis auctis oblongis basi trinerviis nervis secundariis ad alam mediam evanescentibus.

Folia 11-13^{cm} longa, 5-7^{cm} lata, petiola 4-5^{cm} longa; calycis fructiferi tubus 1·5-2^{cm} longus; 1·5-2^{cm} latus; laciniæ auctæ 10-12^{cm} longæ, 2^{cm} latæ.—Borneo (O. Beccari, no. 3034).

6. *D. Lemeslei.*—Ramulis annotinis petiolis pedunculisque velutinis; foliis ovatis acutiusculis basi rotundatis sinuatis vel undulatis supra ad costam inferne pubescentibus, subtus nervo medio venisque primariis pilis stellatis pubescentibus, racemis axillaribus 5-7-floris; calycis fructiferi tubo ovato alato, alis rectis, laciniis auctis oblongo-lanceolatis basi trinerviis nervis secundariis ad apicem evanidis.

Folia 15-20^{cm} longa, 8-12^{cm} lata, petiola ad 5^{cm} longa; calycis fructiferi tubus 1·5^{cm} latus, 2·5^{cm} longus; alæ 5-8^{mm} latæ; laciniæ auctæ 10-13^{cm} longæ, 2^{cm} latæ; crescit in insula Pulo-Condor. (Lemesle, no. 594.)

7. *D. stellatus.*—Ramis geminis petiolisque hispidis, pilis fasciculatis; foliis magnis ovatis subcordatis plus minusve acuminatis,

supra nervo medio venisque primariis villosis, subtus venis primariis nervulisque reticulatis pilis stellatis brevissimis subvelutinis; racemis axillaribus subglabris 3-floris; calycis fructiferi tubo cylindrico glabro 5-alato, alis subundulatis, laciniis auctis oblongis trinerviis glaberrimis.

Folia 20-25^{cm} longa, 12-15^{cm} lata. Petiola 4-5^{cm} longa; calycis fructiferi tubus 5-6^{cm} longus, 2^{cm} latus, alæ 1·5^{cm} latæ; laciniæ auctæ 14-16^{cm} longæ, 3-4^{cm} latæ.—Borneo (O. Beccari, nos. 2555 et 2907).

8. *D. undulatus.*—Foliis ovatis integerrimis plicatis nervis secundariis supra impressis subtus valde prominentibus, petiolis ramis junioribus gemmisque conicis subobliquis pube cinereo vel nigrescente vestitis; calycis fructiferi tubo globoso 5-alato, alis latissimis submembranaceis quam maxime transverse contorto-undulatis; laciniis auctis oblongis trinerviis tenuibus vel membranaceis pilis brevissimis stellatis inspersis.

Folia 22-28^{cm} longa, 13-14^{cm} lata; petiola 4-5^{cm} longa; calycis tubus cum alis 3-3·5^{cm} latus; laciniæ auctæ 12-14^{cm} longæ, 3^{cm} latæ.—Borneo (O. Beccari, no. 1267).

9. *D. Beccarianus.*—Ramis glabris; foliis rhomboïdalibus acuminatis basi cuneatis utrinque glaberrimis; petiolis glabris; gemmis conicis dense villoso-sericeis; calycis fructiferi tubo urceolato sub limbo valde constricto obtuse 5-gono glabro; laciniis auctis obovato-oblongis obscure trinerviis valde reticulatis.

Folia 12-14^{cm} longa, 7-9^{cm} lata; petiola 3-5^{cm} longa; calycis fructiferi tubus 3-4^{cm} longus, 3^{cm} latus; laciniæ auctæ 15-17^{cm} longæ, 3-5^{cm} latæ.—Borneo (O. Beccari, no. 2915).

10. *D. macrocarpus.*—Ramis junioribus petiolisque dense hispido-tomentosis pilis fasciculatis; foliis amplis ellipticis basi rotundatis vel subcordatis obscure sinuatis supra glabratis ad costam pilosis, subtus rari-pilosis, margine ciliatis, junioribus supra sericeo-lanatis pilis basin versus deciduis subtus velutinis, calycis fructiferi tubo subhemispherico pilis stellatis brevibus insperso; laciniis auctis maximis oblongis trinerviis.

Folia 30-40^{cm} longa, 18-25^{cm} lata; petiola 6^{cm} longa; calycis fructiferi tubus 3^{cm} latus, 2^{cm} longus, laciniæ auctæ 20-25^{cm} longæ, 4-5^{cm} latæ.—In Bengalia orientali.

11. *D. globosus.*—Ramis junioribus gemmisque velutinis; foliis rotundatis vel ovato-ellipticis acuminatis crenatis basi obtusis, supra glaberrimis, subtus ad costam puberulis, petiolis pubescentibus pulverulentibus; racemis axillaribus 3-floris; calycis fructiferi tubo globoso glabro; laciniis auctis oblongo-lanceolatis obtusis trinerviis glaberrimis.

Folia 13-15^{cm} longa, 8-9^{cm} lata; petiola 3-5^{cm} longa; calycis fructiferi tubus 2·5-3^{cm} latus; laciniæ auctæ 12-15^{cm} longæ, 3-4^{cm} latæ.—Borneo (O. Beccari, no. 2914).

12. *D. hirtus.*—Ramis cortice cinereo-albescente vestitis, novellis crinitis; gemmis oblongis obtusis; foliis oblongo vel elliptico-lanceolatis acuminatis, basi rotundatis vel obsolete cordatis supra ad costam pubescentibus, subtus ad nervos valde prominentes fasciculatim pilosis; petiolis dense pilosis, pilis fasciculatis; racemis hirsutis 3-floris foliis brevioribus; calycis fructiferi tubo obconico pruinoso glabro, laciniis auctis uninerviis nervis secundariis brevissimis, glaberrimis.

Folia 10-13^{cm} longa 4-5^{cm} lata; petiola 2-3^{cm} longa; calycis fructiferi tubus 1·5^{cm} longus, laciniæ auctæ 5-7^{cm} longæ, 12-15^{mm} latæ.—Borneo (O. Beccari, nos. 779 et 1883).

[The above descriptions are here reprinted for comparison with those of Prof. Thiselton Dyer, contained in the last (April) number of this Journal (p. 103 & seq.), in order that students may possess here the whole of the published material relating to the plants in question. In the following communication Prof. Dyer has reviewed M. Vesque's new species, in relation especially to his own revision of the whole of the known species of the genus.—*Ed. Journ. Bot.*]

REMARKS UPON M. VESQUE'S NEW SPECIES.

By W. T. Thiselton Dyer, M.A., B.Sc., F.L.S.

Since the publication of my paper on *Dryobalanops* and *Dipterocarpus* I have seen the diagnoses of the new species of the latter genus published by M. Vesque in the "Comptes Rendus" for March 2. This would not, however, appear till a week after that date, and consequently would not reach London till the middle of the month. The "Comptes Rendus" is rarely used as a medium of publication for papers on systematic botany, and M. Vesque's reason for choosing it was the desire—a very natural one—of securing priority. Having, however, understood from M. Decaisne that M. Vesque's memoir would appear in the "Annales des Sciences Naturelles," I overlooked, as indeed I was unprepared for, this preliminary instalment. I can only regret the inadvertence which has led to my adding fresh synonyms to an Order in which they are already too numerous.

I cannot, however, but venture the remark that M. Vesque on his part has been somewhat precipitate. Of the twelve new species which he describes, probably less than half will prove capable of being sustained. I will briefly pass them in review in the order in which he has placed them in his communication in the "Comptes Rendus."

1. *D. fagineus*, Vesque, takes precedence of *D. prismaticus*, Dyer.

2. *D. stenopterus*, Vesque, is based upon Beccari, 3762; I refer to the same species Beccari, 3417. *D. oblongifolius*, Blume, is I have no reason to doubt the same species. It was described, it is true, from foliage only; but an authentic specimen in the Kew Herbarium seems to me quite identical with Beccari's plants quoted above.

3. *D. nudus*, Vesque, takes precedence of *D. pentapterus*, Dyer. I refer to this also Beccari, 2509, a number which may, however, be a mere clerical error for 2905, which belongs to it.

4. *D. acutangulus*, Vesque. This is undoubtedly identical with the very distinct species described by Scheffer as *D. appendiculatus*. I have had the opportunity of comparing Beccari's plant with an authentic specimen in the Kew Herbarium.

5. *D. geniculatus*, Vesque, anticipates *D. angulatus*, Dyer.

6. *D. Lemeslei*, Vesque, is a species from the Island of Pulo-Condor, off the coast of Cambodia. This is an interesting locality. *D. intricatus*, Dyer, from Cambodia itself, is abundantly distinguished by the plicate wings of the tube of the fruiting calyx. In M. Vesque's

species these wings are quite straight, and judging from the description there is nothing to definitely distinguish it from *D. alatus*, Roxb., which extends eastward to Siam.

7. *D. stellatus*, Vesque, takes precedence of *D. nobilis*, Dyer.

8. *D. undulatus*, Vesque, is certainly identical with *D. Lowii*, Hook., fil. Low's specimens are in the Kew Herbarium. The general habit of the plant, together with the peculiar character of the wings of the calyx-tube, leave no room for hesitation. M. Vesque has overlooked the fact that, as in *D. lamellatus*, the angles of the calyx-tube are furnished each with two wings, so that there are ten in all. I am disposed to think that *D. validus*, Blume, founded apparently upon the foliage of barren shoots, is the same species and therefore takes precedence of the names given by both Dr. Hooker and M. Vesque.

9. *D. Beccarianus*, Vesque, is the plant subsequently described by me as *D. Beccarii*, var. *glabrata*. Having regard to the range of variation in vestiture which occurs even in dried specimens of well-known species of the genus, and which Kurz has also verified in their native forests, I cannot regard *D. Beccarianus* as more than barely entitled to be distinguished as a variety from *D. globosus*, Vesque.

10. *D. macrocarpus*, Vesque, is identical with *D. pilosus*, Roxb. The original description of the species is very brief; but Kurz, who appears to have seen an authentic specimen, identifies Roxburgh's plant with *D. Baudii*, Korthals. In the "Flora of British India" (i., 296) I have characterised the species very briefly, and I find that, either through a printer's error or my own, the dimensions are not quite accurate. The species is abundantly distinct from any other Indian one, but for the sake of comparison with the descriptions given by M. Vesque and Korthals, I have drawn up one founded exclusively upon Indian specimens.

D. PILOSUS, *Roxb.* Arbor, novellis, gemmis cylindraceis vel cylindraceo-conicis petiolisque pilis fasciculatis ochraceis vel ferrugineis dense indutis; foliis vernatione plicatis et admodum sericeo-velutinis, ellipticis vel elliptico-oblongis, acuminatis, basi acutis vel rotundatis et minime retusis, obscure repando-crenatis, margine ciliatis, supra glabratis, ad costam et subtus ad nervos venulasque pilosis; calycis fructiferi tubo ovoideo, obovoideo, vel subsphærico limbum versus haud coarctato, juniore pilis stellato-furfuraceis consperso deinde glabrato, lobis majoribus oblongo-linearibus valide trinerviis obtusis vel minime retusis utrinque glabris, minoribus orbicularibus. *D. Baudii*, Korth. Verh. Nat. Gesch. Bot., p. 59, t. 5. *D. macrocarpus*, Vesque, "Comptes Rendus," lxxviii., p. 627. *Anisoptera? palembanica*, Miq. Flor. Ind. Bat., Suppl., i., 485, ex Kurz. in Journ. As. Soc. Beng., 1870, ii., 65.

Folia 6-18 poll. longa, 3-9 poll. lata, nervis lateralibus utrinsecus ad 26; petiolo 1½-3 poll. longo. Flores . . . . . . Calycis fructiferi tubus 1⅙-1½ poll. longus, 1-1½ poll. latus, lobi majores 6-8½ poll. longi, 1¼-2 poll. lati.

11. *D. globosus*, Vesque, takes precedence of *D. Beccarii*, Dyer. M. Vesque has overlooked the fact that the calyx-tube is not perfectly rounded—that is to say, a transverse section would be obtusely pen-

tangular and not circular, and I have hence placed it in my section *Angulati* though it is not a typical representative of it by any means.

12. *D. hirtus*, Vesque, is anticipated by *D. crinitus*, Dyer, Flor. Brit. Ind., i., 296.

NOTE ON SOME INDIAN *DIPTEROCARPEÆ.*

BY W. T. THISELTON DYER, M.A., B. Sc., F.L.S.

I MAY take this opportunity of making some corrections in my enumeration of the Indian *Dipterocarpeæ*, in the second part of the Flora of British India. This was in type, and printed off many months before publication. In the interim Colonel Beddome published the concluding parts of his "Flora Sylvatica." In one of these he describes (p. ccxxxvi.) *Balanocarpus*, a new genus of *Dipterocarpeæ* from Tinnivelly, with two species. One of these, *B. utilis*, Beddome, I believe to be identical with *Hopea longifolia*, Dyer (Flor. Brit. Ind., i., 309), which I had founded on a plant of Col. Beddome's, referred by him to *Hopea*. Without fruit there is nothing which could possibly separate this plant from that genus. Indeed, Col. Beddome remarks (Flor. Sylv., p. ccxxxvii.): "When in flower only it is scarcely distinguishable from the long-leaved variety of *Hopea parviflora*, which grows in the same localities." The fruit is, however, extremely different from *Hopea*, and I had described it from a very imperfect specimen which I had no means of correlating with the flowering ones as belonging to a new genus intermediate between *Pachynocarpus* and *Vatica*, but to which I refrained from giving a name. (Flor. Brit. Ind., i., 317.)

Colonel Beddome has also anticipated the publication of *Hopea racophlæa*, Dyer, which is identical with *Hopea malabarica*, Bedd. (Ic. Pl. Ind. Or., t. 185.)

A plant from Malacca in both the flowering and fruiting stage, collected by Maingay, has only lately come into my hands, and proves to be identical with an indeterminate plant, from Penang, 9018 in the Wallichian Herbarium. As it is apparently undescribed I give a diagnosis. It is aberrant in the character of its fruit, which recedes from *Vatica* in the direction of *Balanocarpus*. Here, however, the agreement ceases; *Balanocarpus* agrees in everything except fruit with *Hopea*, while Maingay's plant is in everything except fruit a typical *Vatica*.

VATICA (ISAUXIS) WALLICHI, *Dyer*. Arbor, ramulis strictis ad angulum 30° divergentibus, teretibus, brunneis, verruculis albis conspersis, glaberrimis; foliis ovatis, obtusiusculis, firmis, utrinque glaberrimis, costa media nervisque lateralibus siccitate supra prominentibus, subtus pallidioribus; paniculis cymoso-congestis; florum partibus (præsertim calyce staminibusque) omnino *Vaticæ;* fructu coriaceo-baccato, conico siccitate rugoso, stylo apiculato, calycis lobis parcissime auctis paullo incrassatis capsulæ adpressis ovatis acutis.

Penang, *Wall. Cat.*, 9018. Malacca, *Maingay*, 201.

Folia 4-5 poll. longa, 1½-2½ poll. lata; petiolo ⅛-¼ poll. longo. Alabastra ¼ poll. longa. Calycis fructiferi lobi aucti ¼ poll. longi. Capsula ½ poll. longa.

BOTANICAL BIBLIOGRAPHY OF THE BRITISH COUNTIES.

By Henry Trimen, M.B., F.L.S.

(*Continued from page* 112.)

Monmouth.—[35. Pr. *Severn.*] Drained by Rivers Wye and Usk.

1. – No complete Flora.

2.—Gough ii., 492.—B. G., 415.—New B. G., 215.—Woods in Phyt. iii., 1053.

Abergavenny.—Purton, Midland Flora, vol. ii., p. 747.

Pont Newydd.—Conway in New B. G., ii., 629.

Hereford.—[36. Pr. *Severn.*] Almost entirely drained by Wye.

1.—W. H. Purchas in Trans. Woolhope Club, 1867. Tabular summary of Phanerogams and Ferns under 14 districts formed mainly on the natural drainage. Intended as the introduction to a complete detailed Flora.

2.—Gough, ii., 463.—B. G., 325.—New B. G., 214, 627.—Duncomb, Hist of H., 1804, vol. i., pp. 180-186.

Ross.—Purchas in Phyt., ii., 649.

Hereford.—Fungi, see Trans. Woolhope Club.

See Floras of *Malvern* and Worcestershire.

Worcester.—[37. Pr. *Severn.*] Mainly in Severn; small portion of N.W. in Trent basin.

1.—E. Lees, Flora of W., 1867. Four artificial districts. Special localities only for rarities. Account of previous writers given. Cryptogams not included.

2.—Gibs., 527.—Gough, ii, 374.—B. G., 656.—New B. G., 194, 620. Pitt, Agriculture of W., 1810.—Hastings, Ill. Nat. Hist. W., 1834.—Perry in Mag. Nat. Hist., vol. iv.

Worcester.—T. Baxter in Stanley's Guide to W.

Wyre Forest.—G. Jorden in Phyt., N.S., 1855, 281, 354.

Kidderminster.—See Withering's Nat. Arr., ed. 2, by Stokes, 1787.

Malvern Hills.—Lees, Botany of M. H., 1843, ed. 3, 1868. Includes Mosses and Lichens.

Stourbridge.—Scott's S. and its Vicinity, 1832.

Clent Hills.—Phyt., N.S., ii., 385.—W. Mathews, Clentine Rambles, 1868. Rarer species. No Cryptogams.

See Purton's Midland Flora and *Birmingham* Floras (under Warwick).

3.—Herbarium at Worcester Museum.

Warwick.—[38. Pr. *Severn.*] Chiefly Severn; N. part in Trent basin; a very small portion of S.E. in Thames.

1.—No complete Flora.

2.—Gibs, 515.—Gough, ii., 350.—B. G., 633.—New B. G., 181, 611.—W. G. Perry, Plantæ Varvicenses Selectæ, 1820. Linnean system. List of authorities quoted given. Mosses included.—Mosses, Bagnall in Journ. Bot., 1874, p. 18.

Birmingham.—Freeman in Phyt., i., 261.—Fl. Plants & Ferns of B. in Proc. B. Nat. Hist. Soc., 1869-70. 10 miles' radius.

Includes Algæ, Mosses, and Jungermanniеæ.—Absent plants, Bagnall in Journ. Bot., 1872, 336.

Alcester.—Purton, Midland Counties Flora, 1817. App., 1821. Linnean system, descriptive, only living authorities quoted. Cryptogams included.

Coventry.—Kirk in Phyt., ii., 969.

Rugby.—List in R. School Nat. Hist. Soc. Rep. for 1868 and subsequent years.

3.—Perry's Herbarium in the Warwick Museum.—Purton's Herbarium in Museum of Worcester Nat. Hist. Soc.—Herbarium of Rugby School Nat. Hist. Soc.

STAFFORD.—[39. Pr. *Severn*] Mainly Trent; a narrow strip of W. border in Severn; a very small portion of N. in Mersey basin.

1.—No complete Flora.

2.—Gibs , 539.—Gough, ii., 396.—B. G., 532.—New B. G., 207, 623.—Plot, Nat. Hist. of S., 1686, pp. 199-227.—R. Garner, Nat. Hist. of S., 1844, pp. 333-445. Complete list. Linnean System. Includes Cryptogams. Supplement, 1860, p. 36.

Tutbury & Burton-on-Trent.—E. Brown in Sir O. Mosley's Nat. Hist. of T., 1863. Assisted by Bloxam and Coleman. 10 miles' radius. Cryptogams included.

Dudley.—Fraser in Trans. D. Sc. Soc. & Field Club.

3.—Local herbarium belonging to Dudley Scient. Soc.

SALOP.—[40. Pr. *Severn*.] Almost entirely in Severn basin; small portions of N. in Mersey basin.

1.—W. A. Leighton, Flora of S., 1841. Linnean system. Full descriptions, with figures of details of *Rumex*, *Carex*, &c. No districts. Cryptogams not included.—Lichens; many in Leighton's Lichenes Exsiccati.

2.—Gibs., 554.—Gough, ii., 423.—B. G., 510.—New B. G., 209, 624.

Ludlow.—Westcott in Phyt., i., 567. Includes Cryptogams.—A. Marston, Ferns and Rare Plants of L., 1870.

Bridgenorth.—Bot. Chron., pp. 102, 107.

3.—Many of Leighton's S. plants now in British Museum. Salwey's Lichens in Ludlow Museum.

WALES.

Gibs, 699.—S. Brewer, Botanical Journey through Wales, 1726. MS. in Bot. Dep. Mus. Brit.—J. Lightfoot, Journal of a Botanical Excursion in Wales, 1775. MS. in Bot. Dep. Mus. Brit. (Includes some *Gloucester* plants.) The plants collected are in the British Museum.—J. Ball in Bot. Gaz., i., 107.

GLAMORGAN.—[41. Pr. *S. Wales*.] Drained by small rivers flowing into Bristol Channel.

1.—No complete Flora.

2.—Gough, ii., 503.—B. G., 298, 753.—New B. G., 216, 630. Woods in Phyt., iii., 1053.

Swansea.—Gutch in Phyt., i., 109, 119, 141, 180, 377; includes Cryptogams. — Westcombe in Phyt., i., 780. — Dillwyn, Materials for Flora of S., 1848; rarer plants, alphabetical; and in History of S.; 20 miles' radius.

Brecknock.—[42. Pr. *S. Wales.*] S. portion drained by Usk; N. part by Wye.

1.—No complete Flora. No list of common plants received by Mr. Watson.

2.—Gough, ii., 476.—B. G., 31.—New B. G., 322, 631.—Westcombe in Phyt., i., 781; a few rarities.

Radnor.—[43. Pr. *S. Wales.*] Chiefly drained by Wye; small parts of N. by Severn.

1.—No complete Flora. No list of common plants obtained by Mr. Watson.

2.—B. G., 508. Gough, ii., 469.—Westcombe in Phyt., i., 781.

Carmarthen.—[44. Pr. *S. Wales.*] Mostly drained by Towy into Bristol Channel; part of N.W. by Teify into St. George's Channel.

1.—No complete Flora.

2.—Gough, ii., 510.—B. G., 75.—New B. G., 219.

Pembroke.—[45. Pr. *S. Wales.*] Drains N. & S. from a central watershed.

1.—No complete Flora.

2.—Gough, ii., 523.—B. G., 503.—New B. J., 219.—S. Pembroke, C. C. Babington in Journ. Bot., 1863, 258; Trimen in Journ. Bot., 1867, 301.

Tenby.—[Falconer,] Catalogue of plants in neighbourhood of T., 1848; no Cryptogams. E. Lees in Phyt. iv., 1031.

Cardigan.—[46. Pr. *S. Wales.*] Chiefly drained by small streams into S. George's Channel; a portion of E. by Towy.

1.—No complete Flora. List of common plants very incomplete, Watson.

2.—Gough, ii., 529.—B. G., 72.—New B. G., 221.

Aberystwith.—E. Lees in Phyt., i. 38.—T. Owen Morgan. Flora Ceveticæ superioris, 1849. Linnean system. Includes Algæ.

Montgomery.—[47. Pr. *N. Wales.*] Principally drained by Severn; part of W. by Dovey into S. George's Channel.

1.—No complete Flora. No list of common plants received by Mr. Watson.

2.—Gough, ii., 537.—B. G., 416.—New B. G., 222, 631.

Newtown.—Naturalist, iii., 159.

Merioneth.—[48. Pr. *N. Wales.*] W. part drained by small rivers into S. George's Channel; E. part by Dee.

1.—No complete Flora. No list of common plants received by Mr. Watson.

2.—Mart., 114.—Gough, ii., 547.—B. G., 393.—New B. G., 224, 631.

Llandderfel.—Jas. Irvine in Naturalist, ii., 70.

Carnarvon.—[49. Pr. *N. Wales.*] S. W. half drained by small streams into S. George's Channel; N. E. half into Irish Sea.

1.—No complete Flora.

2.—Mart., 112.—Gough, ii., 562.—B. G., 77.—New B. G., 235, 633. Winch. in Mag. Nat. Hist.

Llandudno & Gt. Orme's Head.—E. Lees in Phyt. iii., 869.—P.

Inchbald, List of Plants, &c., 1864.—Baxter in Catherall's Guidebook.

Snowdon & *Twll Du.*—W. Bingley, N. Wales, 1814, pp. 169 & 189.

Denbigh.—[50. Pr. *N. Wales.*] N. part drained by Clwyd in Irish Sea; W. by Dee; small part in S. in Severn basin.

1.—No complete Flora.

2.—Gough, ii., 587.—B. G., 166.—New B. G., 244, 634.

Wrexham.—J. Rowland in Phyt., i., 421.

Flint.—[51. Pr. *N. Wales.*] Drained by Clwyd and Dee into Irish Sea.

1.—No complete Flora. List of common plants very incomplete, Watson.

2.—Gough, ii., 597.—B G., 291.—New B. G., 252, 635.

Anglesea.—[52. Pr. *N. Wales.*] Drained by small streams flowing N. E. & S. W. from a watershed across the Island.

1.—H. Davies, Welsh Botanology, 1813. Linnean System. Cryptogams included. Has a catalogue of Welsh names.

2.—Mart., iii.—Gough, ii., 574.—B. G., 1.—New B. G., 226, 632.

3.—Davies' Anglesea plants in the British Museum.

SHORT NOTES.

Je trouve dans le cahier de Décembre, 1873, de votre *Journal*, p. 376, un article de M. le Dr. Henry F. Hance, dans lequel, à l'occasion d'observations intéressantes sur un *Pterocarya* et d'un nom spécifique dont il préfère ne pas faire usage, il s'exprime ainsi:—"Those who regard the Paris Congrès International de Botanique as a scientific Œcumenical Council, the decrees of which were inspired by a kind of Divine *afflatus*, will, of course, in obedience to article 57 of the 'Lois de la Nomenclature Botanique,' promulgated by that august assembly, adopt the latter name," etc. Il est possible que M. le Dr. Hance ait rencontré en Chine des botanistes qui ont eu cette haute opinion du Congrès auquel j'ai eu l'honneur de présider, mais ce n'est pas assurément ce Congrès lui-même, car il a voté, à l'unanimité, simplement de *recommander* son recueil des lois comme le meilleur guide à suivre pour la nomenclature dans le règne végétal, et l'article 2 porte expressément:—"Les règles de la nomenclature ne peuvent être ni arbitraires ni imposées. Elles doivent être basées sur des motifs assez clairs et assez forts pour que chacun les comprenne et soit disposé à les accepter." Permettez-moi d'ajouter deux mots. Notre travail a été fondé sur les usages adoptés, après réflexion, par la majorité des meilleurs botanistes du xix^{me} siècle. Nous n'avons jamais innové sur le fond, du moins dans ce qui présente une importance même légère. Quant à la forme, il y a une assez grande différence relativement aux recueils analogues de Linné, Lindley, De Candolle, et les zoologistes de la British Association de 1842. Cette différence est que j'ai imité la classification lumineuse des codes français, en groupant les articles par chapitres, selon leur nature, et mettant au commencement, fort en évidence, un chapitre sur les *principes dirigeants*.* De cette manière lorsqu'un auteur admet deux ou trois principes essentiels, comme celui, par exemple, de l'article 3, "d'éviter toute création inutile de noms," il est conduit à admettre le reste, s'il veut être conséquent avec lui-même.—ALPH. DE CANDOLLE.

TORTULA SINUOSA IN WARWICKSHIRE.—It may be interesting to note that I find *T. sinuosa* in two widely distant localities in Warwickshire. Near Wootton Wawen, I find it on the mortar of a brick bridge; in this locality the plant is stunted. I also find it on an old tree stump, near Fenny Compton; in this locality it grows on the lias clay soil that has overspread the stump, and is a more vigorous plant. I have no doubt that when sought for it will be found in many other localities.—J. BAGNALL.

Botanical News.

ARTICLES IN JOURNALS.

Ann. des Sc. Nat. (t. xix., n. 1. *December*, 1873.)—J. Chatin, "On the Development of the Ovule and Seed in Scrophulariaceæ, Solanaceæ, Boraginaceæ, and Labiatæ" (tab. 1-8).—(n. 2 & 3. *February*.)—E. Prillieux, "On the Coloration and Iridescence of *Neottia Nidus-avis*" (tab. 10).—E. Janczewski, "Observations on the Reproduction of some *Nostochineæ*" (tab. 9).—A. Barthélemy, "On the Respiration and Circulation of Gas in Plants."—L. A. Crié, "Micromycetes Exotici Novi."—Boehm, "On the Respiration of Terrestrial Plants."

Nederlandsch Kruidkundig Archief. (ser. 2, v. i., pt. 3, 1873.)—A. J. de Bruijn, "On *Rumex Steinii* and *R. leptanthes* (tab. 7), and Notes on *Enodium cœruleum*, *Glyceria fluitans*, and *Trifolium minus*."—C. M. van der Sande Lacost, "Additions to Bryological Flora of Holland."—C. A. J. A. Oudemans, "Additions to Mycological Flora of Holland."—Ib., "On a Fruit, half Citron, half Orange."—W. F. R. Suringar and T. H. J. Abeleven, "Plants of Alkmaar, 1871."

MARCH.

Grevillea.—S. O. Lindberg, "On Species of *Timmia*" (translation).—M. C. Cooke, "British Fungi" (contd.).—Nylander, "New British Lichens" (translation).

Oesterr. Bot. Zeitschr.—G. Strobl., "Species of *Scleranthus* of Ætna, &c."—L. Celakovsky, "On the genus *Trifolium*" (contd.)—J. Pancic, "Botanical Excursion in Montenegro in 1873."—A. Kerner, "Distribution of Plants, &c." (contd.).—R. v. Uechtritz, "Note on *Calamintha ætnensis*, Strobl."—H. Kemp, "Supp. to Flora of Neighbourhood of Vorarlberg" (contd.).

Bot. Zeitung.—J. Scott, "On the Indian Species of *Loranthus* and the

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* *Leading Principles* de la Traduction anglaise: *Laws of Botanical Nomenclature*, in 8vo., 1868, p. 17.

Parasitism of *Santalum album*" (contd.)—F. Kienitz-Gerloff. "Comparative Investigation into the Development of the Spermogonia of *Hepaticæ*" (tab. 3, 4).—E. Stahl, "On Development of Lichens."—W. G. Farlow, "On a sexual Reproduction of young plants on Prothallium of a Fern."—R. Wolff, "Origin of Ascospores of *Erysiphe graminis*."—Ib., "Identity of *Peridermium Pini* with *Coleosporium compositarum*, f. *senecionis*."

Flora.—F. Arnold, "Lichenological Fragments, xvi" (tab. 2).—L. Celakovsky, "On the morphological significance of Seed Buds."—J. Müller, "On the Conditions of Validity in Scientific Nomenclature" (contd.).—A. Geheeb, "Short Bryological Notes."

Botanisk Tidsskrift (1873, pt. 2).—R. Pedersen, "On the Development of the Cyathium in *Euphorbia*" (tab. 2).—J. Lange, "Observations on Leafing, Flowering and Defoliation at Copenhagen in 1867-71."

A supplement to the Fauna and Flora of Eastbourne has been printed by Mr. F. C. S. Roper. Some seventy additional plants, Phanerogams and Cryptogams, are included.

Prof. Morren, of Liége, has compiled a list of Botanical Gardens, Chairs of Botany, and other establishments, throughout the world, arranged under the various countries, and giving under each the names and titles of the present directors, occupants, &c. This very useful list appears in the "Belgique Horticole" for February, and has since been reprinted. The compiler will be glad to receive notice of any errors, or of the changes that may occur, so that subsequent editions may be rendered correct.

Mr. Britten has compiled a List of Suffolk plants, which is published in White's History of the county. Localities for some of the rarest species are given.

Mr. J. Harbord Lewis, of 180, Mill Street, Liverpool, proposes to issue twenty sets of British Rubi if names of subscribers are to hand by the 1st of June. The list sent of twenty species includes some of our most interesting forms, and printed tickets will accompany them, with the remarks of some of the principal English Rubologists. Price £1 per set exclusive of carriage.

We are requested to state that the English Dialect Society has made arrangements for publishing Messrs. Britten and Holland's "Dictionary of English Plant-Names." This work has long been in preparation, and is a very extensive undertaking. It is expected that the first part containing letters A to D will form one of the Society's publications for 1874, and lists of local plant-names should therefore be sent without delay to Mr. Britten, at the British Museum.

The remarkable failure of the attempt made by Lord Cathcart, late President of the Royal Agricultural Society of England, to obtain some original investigations into the potato blight, by the offer of a prize of £100 for the best essay on the subject, has induced the council of the Society to secure the services of Prof. De Bary to make *Peronospora infestans*, Mont., a special study, with the view of discovering the life-history of the parasite before it attacks the potato. We understand that M. De Bary has already entered on his inquiry.

Original Articles.

ON A *RUMEX* FROM THE SOUTH OF ENGLAND.

By Henry Trimen, M.B., F.L.S.

(Tab. 146.)

The subject of this notice was found in August last (1873) by Mr. Warren at Heene, near Worthing, Sussex, growing in a nearly dried-up pond. A single large plant only was seen which grew in immediate proximity to some fifty plants of typical *R. maritimus* and as many of *R. conglomeratus*. As may be seen by the accompanying figure, the plant differs a good deal at first sight in its general aspect from any of our native species, but the small size of the plate does not allow the much-branched and spreading character to be fully exhibited.

In attempting to fit the plant to the descriptions given in English text-books, it was evident that it presented several differences from both *R. maritimus* and *R. palustris*, the only species to which it could be referred. Nor did a search through the numerous foreign species which have been described bring to light any to which the plant could be referred with any greater probability. A careful examination, however, showed fewer points of difference from *R. maritimus* than from its different habit might have been expected, and I have therefore placed it under that species, adding also, for the sake of distinction, the designation "forma *Warrenii*" in commemoration of the discoverer who has so successfully investigated our native Docks.

The root-leaves were withered away before the plant was gathered and cannot therefore be described. The stem-leaves present no distinctive characters, but taper to their bases, the upper ones being greatly attenuated below, like those of *R. maritimus* and *palustris*. The stem is very tall and copiously branched, two or three branches often coming off together from the lower nodes, and the branches frequently again branched in their lower portion where each whorl is provided with a leaf. All the branches are very long and slender, spreading, wandlike, and rather flexuose, with very numerous rather dense whorls of flowers somewhat distant below, approximated but never crowded together above, where they are leafless. The *ripe* petals are rather larger than those of *R. maritimus*, and, including the teeth, about as long as broad, with two or three teeth on either side of the lower half; the teeth are less setaceous and considerably shorter than those of *R. maritimus*, straight, spreading and acuminate, and about as long as the width of the petal, the upper half of the petal is triangular, with a bluntish apex, and each petal bears a large tubercle broader and rather more prominent than those of *maritimus*, but of the same greenish-gold colour which gives the bright appearance to that species. The nut is considerably larger than in the latter.

This description of the ripe petals is made from fertile flowers in which the nuts become properly matured. In very few, however, out of the thousands of flowers produced does this happen. In the rest the nut is small and shrivelled, and the petals therefore do not acquire their full development, but at their ripest condition remain small (about the size of ordinary *maritimus* when ripe), narrower in proportion to their length and with less prominent tubercles. The great number of these small flowers gives the inflorescence its characteristic appearance; the larger ones with ripe fruit have to be searched for.

Two explanations of this condition present themselves. The plant may be an unhealthy or undeveloped and barren state of *R. maritimus*. Dr. Boswell Syme, to whom specimens were submitted for examination, takes this view, and compares the plant with a barren and much less advanced plant of *R. palustris* collected by himself on the Thames bank below Greenwich and obviously grown under some very unfavourable circumstances. The excessive luxuriance of Mr. Warren's plant certainly points in the direction of undue nutrition and too much shade, and the scarcity of ripe fruit would be likely to result from the same cause. *R. maritimus* occasionally occurs with somewhat distant whorls, and such specimens are not unfrequently misnamed *R. palustris*. On the other hand our plant has not an unhealthy appearance, and profuse production of flowers is an unusual result of deprivation of sunshine. It must be remembered also that the plant grew in actual contact with numerous examples of *R. maritimus* which in no way departed from the usual condition of the species, though it must be supposed that they were subjected to the same influences.

The other explanation is that of hybridity. This is a hypothesis easily proposed and equally difficult to prove or disprove. Mr. Warner has suggested it as perhaps meeting the case of the plant under discussion, and it must be allowed that we have here several circumstances which lend it considerable probability. The chance production of a hybrid affords a fair solution of the occurrence of a single plant with characters of its own growing in immediate contact with numerous plants, all referable to two well-marked species of the same genus, when it is found that the plant presents characters which are a mixture of those of its companions. The collector noted, by comparison when gathered, that the habit of the plant was exactly that of the *R. conglomeratus* with which it grew, and that the tubercles also looked more like those of the latter than of *R. maritimus*. A comparison of the ripe petals with those of *R. maritimus* (from Cheshire) shown in the plate (figs. 2 and 2c) exhibits a departure, as above described, from the form of *R. maritimus* in the direction of the toothless blunter ones of *R. conglomeratus*. I am, however, fully aware that the question cannot be decided in this manner: on similar grounds it has been maintained by Meyer* that *R. palustris*, Sm. is a hybrid between these very same two species, *R. maritimus* and *R. conglomeratus*, a view which from English experience of the plants seems otherwise very improbable.

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* Flora Hanoverana excurs. (1849), p. 471.

In looking through the Docks allied to *R. maritimus* my attention was drawn to the *R. Steini*, described by Becker,[*] from plants found by the Main, near Frankfurt; and from the description of this given in Meisner's monograph,[†] where a similarity to *R. conglomeratus* is specially mentioned, it seemed to come very near to Mr. Warren's plant.

Attention has already been called to *R. Steini* by Babington in a paper[‡] on the *R. palustris* of Smith, with which the author considered it identical, depending mainly on Sturm's figure.[‖] Boswell Syme[§] places it simply as a synonym of *R. palustris*. As, however, little seemed to be accurately known about the plant and its claims to rank as a distinct form, I applied to the Curator of the Herbarium at the Royal Gardens of Brussels, who courteously sent me Becker's type from the collection of Von Martius, now the property of the Belgian nation. This specimen, which consists of a root-leaf and a single lateral branch, has been fully and accurately described in the elaborate monograph of the genus in Schultes' "Systema Vegetabilium."[¶] It is there remarked that the plant would be considered a variety of *R. palustris*, were it not for the broader root-leaves almost cordate at the base, the lax verticils, and the larger and more strongly reticulated petals. I agree with Boswell Syme[**] in placing little reliance on the form of the base of the root-leaves, and the other characters are, I believe, in this case due to unhealthy growth. Becker's type specimen of *R. Steini* seems to me much such an ill-nourished plant of *R. palustris* as that from the Thames side above alluded to; nearly all the flowers are abortive, and the petals shrivelled or undeveloped. There were but four or five flowers with ripe nuts and well-grown petals, and one of the latter is figured on the plate along with one of *R. palustris* (from Chelsea) for comparison. (Figs 2a, 2b.) Its large size is striking, but the undeveloped flowers were smaller than those of ordinary *R. palustris*. *R. Steini* is considered a hybrid by Döll,[††] the presumed parents being *R. palustris* and *R. obtusifolius;* De Bruijn in a paper recently published,[‡‡] recording its discovery in Holland, comes to the same conclusion as to its origin.

DESCRIPTION OF TAB. 146.

Rumex maritimus, L., forma (hybrida?) *Warrenii*, from specimens collected at Heene, near Worthing, Sussex, by the Hon. J. L. Warren. 1. Perianth with ripe fruit. 2. Inner perianth-leaf (petal) when mature. 3. Nut. 2a, 2b, 2c. Mature petals of *R. palustris*, Sm., *R. Steini*, Beck., and *R. maritimus*, L., respectively. Details × 4 diam.

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[*] Flora d. Gegend um Frankfurt-a-M. (1828), i., p. 165.

[†] DC. Prod., xiv., p. 60 (1856).

[‡] Bot. Gazette, i., p. 296 (1849).

[‖] Deutschl. Flora, bd. 17, hft. 73, t. 3.

[§] Eng. Bot., ed. 3, viii., p. 43.

[¶] Syst. Veget. vii., para. 2, p. 1390 (1830).

[**] l.c., p. 44 (see also Fl. Middlesex, p. 239, note).

[††] Rheinische Flora, p. 305 (1843).

[‡‡] Nederlandsch Kruidkundig Archief, 1872-3, p. 243. A new species, *R. leptanthes*, De Bruijn, also found in Holland, is described here.,

ON NEW DRACÆNAS FROM TROPICAL AFRICA.

By J. G. Baker, F.L.S.

It is a point that has never been fully illustrated that as regards number of species the genus *Dracæna* attains its maximum in Tropical Africa. Last year I drew up a synopsis of the Indian species (Journ. Bot., 1873, p. 261.), describing those gathered by Wallich and others which had not been already characterised. In the present paper I propose to go through the Tropical African species, and will give names and references only for those that are already known, but describe in detail all those with which I am acquainted that have not been already characterised.

Group 1.—*Folia sessilia ensiformia ascendentia.*

1. D. Kirkii, *Baker*, *n.sp*—Truncus arboreus ramis junioribus floriferis 3 lin. crassis. Folia densa ascendentia ensiformia 15-18 poll. longa medio 9-12 lin. lata e medio ad apicem et basin angustata supra basin 3-4 lin. lata arundinaceo-coriacea dimidio inferiori distincte costata, venis tenuibus immersis, marginibus concoloribus. Panicula pedalis et ultra, ramis sublaxe racemosis ascendentibus arcuatis 6-9 poll. longis, 2 poll. latis. Pedicelli 1 lin. longi, inferiores fasciculati. Bracteæ minutæ deltoideæ. Perianthium 9 lin. longum albidum segmentis tubo 1 lin. crasso duplo superantibus. Antheræ filamentis filiformibus 4-5-plo breviores. Stigma demum exsertum. *Insula Johanna ad lacum Zilanza, alt.* 2500 *pedes.* Dr. Kirk!.

2. D. Mannii, *Baker*, *n.sp.*—Truncus arboreus 30-pedalis. Rami juniores floriferi 2-3 lin. crassi. Folia ascendentia modice conferta ensiformia rigida sordide viridia concoloria 12-18 poll. longa, medio 9-12 lin., supra basin 4-6 lin. lata, ad apicem longe attenuata, subtiliter multinervata, costa subtus dimidio inferiore perspicua. Panicula terminalis breviter pedunculata deltoidea ramis patentibus simplicibus racemosis. Racemi 3-6 poll. longi, expansi 1½ poll. lati. Pedicelli inferiores 3-6 ni 1-2 lin. longi apice articulati. Bracteæ minutissimæ evanescentes. Perianthium viridulum 6 lin. longum segmentis tubo vix 1 lin. crasso duplo superantibus. Antheræ 1. lin. longæ filamentis filiformibus quadruplo breviores. Stigma demum exsertum. *Guinea borealis ad ripas fluminis Old Calabar.* G. Mann, 2329!, Rev. W. C. Thomson!.

3. D. umbraculifera, *Jacq. Hort. Schoen.*, i., 50, t. 95. Mauritius.

4. D. Draco, *Linn.* As has already been pointed out by Regel, D. Ombet, described by Kotschy and Peyritsch in "Plantæ Tinneanæ," p. 47, from the mountains of Nubia, does not appear to be safely separable from the familiar Canarian species.

5. D. arborea, *Link. (D. Knerckiana,* K. Koch.) A plant long known in gardens in a flowerless state. Panicula terminalis longe pedunculata 1½-2 pedes longa et lata, ramis divaricatis inferioribus copiose ramosis. Racemi subdensi 3-6 poll. longi, pedicellis 4-5 lin. longis inferioribus 3-4-nis supra medium articulatis. Bracteæ minutæ

deltoideæ. Perianthium albidum 7-9 lin. longum, segmentis tubo 1 lin. crasso duplo longioribus. Antheræ oblongæ 1 lin. longæ. Stigma vix exsertum. Bacca si monosperma magnitudine cerasi. *Guinea borealis ad ripas fluminis Nun*, G. Mann, 454 !. D. SAPOSCHNIKOWI *Regel*, *Gartenflora*, t. 705, described and figured from garden specimens, mainly differs from *arborea* by its smaller flowers, and will probably prove an African species.

6. D. MARGINATA, *Lam.* Madagascar.

GROUP 2.—*Folia densa sessilia oblanceolata ascendentia.*

7. D. PERROTTETII, *Baker, n.sp.* Truncus arboreus 12-pedalis ramis junioribus floriferis 2-3 lin. crassis. Folia ascendentia conferta sessilia oblanceolata 9-12 poll. longa, medio 9-12 lin., supra basin 2-3 lin. lata, acuta modice firma purpureo tincta præter apicem distincte costata venis tenuibus immersis, marginibus concoloribus. Panicula terminalis deltoidea interdum pedalis ramis laxe racemosis divaricatis. Pedicelli 2 lin. longi apice articulati inferiores fasciculati. Bracteæ deltoideæ minutæ. Perianthium album 1 poll. longum segmentis tubo cylindrico duplo superantibus. Antheræ 1½ lin. longæ. Stigma demum exsertum. *Senegambia*, Perrottet, 785, in Herb. DC. !. *Nigritia ad Nupe*, Barter, 1511 !, and a variety with smaller leaves and simple racemes gathered by Heudelot in Senegambia.

8. D. FRAGRANS, *Gawl.*, Bot. Mag., t. 1081. Of this I have seen wild specimens gathered by Afzelius at Sierra Leone, in Abyssinia by Quartin-Dillon, and in the Zambesi country by Dr. Meller and Dr. Kirk.

9. D. CONCINNA, *Kunth.* Sent by Mr. Horne from Mauritius. Flowers unknown.

GROUP 3.—*Folia sessilia sublaxa patentia ensiformia vel oblanceolata.*

10. D. REFLEXA, *Lam.* This appears to be a very variable plant, if *D. cernua* of Jacquin and *D. salicifolia* of Regel be, as I suppose, varieties only. We have what agrees with the last, wild from Madagascar, gathered both by Dr. Meller and Gerrard. The headquarters of the type are Mauritius, Bourbon and Madagascar, but we have it also from Guinea and Zambesi-land. In flower, it may be known from all the other species by its short campanulate perianth-tube, like that of the New Zealand Cordylines.

GROUP 4.—*Flores racemosi. Folia contigua oblonga petiolata.*

11.—D. DENSIFOLIA, *Baker, n.sp.* Truncus simplex apice florifero 3 lin. crasso. Folia ascendentia modice conferta oblonga 4-6 poll. longa medio 2-3 poll. lata arundinaceo-coriacea concoloria, distincte costata venis tenuibus immersis obliquis, apice deltoidea, basi spathulato-angustata. Petioli 3-6 poll. longi, superne plani basi caulem totam amplectantes. Racemus terminalis brevis breviter pedunculatus floribus multis in glomerulos sessiles alternos dispositis. Pedicelli 1½-2 lin. longi. Perianthium 12-15 lin. longum, segmentis tubo gracillimo brevioribus. *Fernando Po, et ad ripas fluminis Gaboon*, G. Mann, 1037 !.

12. D. FONTANESIANA, *Schult. fil*, = *Cordyline Fontanesiana*, Göp-

pert, Nova Acta Imp. L. C. Acad., xxv., t. 3. *Madagascar*, Goudot, in Herb. DC.!.

13. D. GOLDIEANA, *Hort. Bull, Florist*, 1873, 187. A fine plant, with general habit like the preceding, but the large oblong bright green leaves banded with white, lately introduced from West Tropical Africa by Mr. Bull. It has not yet flowered.

14. D. GLOMERATA, *Baker, n.sp.* Truncus simplex 8-pedalis, apice florifero 3 lin. crasso. Folia contigua ascendentia oblonga, maxima 6-9 poll. longa, medio 3-4 poll. lata, basi deltoidea, petiolis 4-5 poll. longis, superiora breviora 3-6 poll. longa, medio 2-3 poll. lata, basi magis rotundata, petiolis latis 1-2 poll. longis, basi caulem totam amplectantibus, arundinaceo-coriacea concoloria, venis tenuibus curvatis, præter apicem subtus distincte costata. Panicula terminalis breviter pedunculata deltoidea ramis brevibus arcuatis. Flores ad apices et nodos laterales ramorum more *D. fragrantis* 30-40 vel plures in glomerulos globosos 1½ poll. latos congesti. Pedicelli 1-1½ lin. longi. Bracteæ minutæ evanescentes. Perianthium 6 lin. longum, segmentis tubo gracillimo ad basin incrassato triplo brevioribus. Antheræ flavæ, filamentis filiformibus triplo breviores. *Africa tropicalis occidentalis ad insulam Kobi*, 1° N. lat., G. Mann, 1630!.

GROUP 5. *Flores racemosi. Folia contigua oblanceolata petiolata.*

15. D. THALIOIDES, *Morren, Belg. Hort.*, 1860, 348 *cum icone* = *D. Aubryana*, A. Brong., Flore des Serres, t. 1522-3. *Ad ripas fluminis Gaboon*, G. Mann, 1036!, 1038!.

16. D. HUMILIS, *Baker, n.sp.* Truncus brevissimus simplex apice florifero 2-3 lin. crasso. Folia contigua ascendentia oblanceolata 6-12 poll. longa, infra medium 2-2½ poll. lata acuminata basi deltoidea arundinaceo-coriacea concoloria subtus dimidio inferiori costata venis tenuibus immersis subrectis. Petioli suberecti 9-12 pollicares medio graciles firmi ½ lin. crassi basi valde dilatati striati caulem totam amplectantes. Racemus simplex terminalis breviter pedunculatus 3-4 pollicaris. Flores subsessiles ascendentes fasciculati, bracteis minutis membranaceis deltoideis evanescentibus. Perianthium 6 lin. longum segmentis tubo æquilongis. Antheræ filamentis filiformibus 4-5-plo breviores. Bacca si monosperma 3 lin. crassa siccitate nigra. *Africa tropicalis occidentalis ad ripas fluminis Bagroo*, G. Mann, 898!.

GROUP 6.—*Flores racemosi vel umbellati. Folia brevissime petiolata patula pseudo-opposita vel ternata.*

17. D. SURCULOSA, *Lindley, Bot. Reg.*, *t.* 1169; Hook., Bot. Mag., t. 5662.—*Sierra Leone*, Afzelius!; *Old Calabar*, G. Mann, 2327!; *Nigritia ad Angiama*, Barter 2095!.

18. D. CAMEROONIANA, *Baker, n.sp.* Suffrutex 15-pedalis habitu omnino *D. surculosæ* ramulis lignosis virgatis divaricatis floriferis apice 1 lin. crassis. Folia patula 2-4-na pseudo-verticillata oblongo-oblanceolata 4-8 poll. longa medio 1½-2 poll. lata acuta basi in petiolum brevissimum sensim angustata arundinaceo-coriacea concoloria ad faciem inferiorem præter apicem costata venis tenuibus immersis parum curvatis. Racemi terminales 3-9 poll. longi expansi 2 poll. lati rachi flexuoso, fasciculis multis alternis sessilibus 4-12 floris instructi. Pedicelli 1½-2 lin. longi medio articulati. Bracteæ minutæ

membranaceæ deltoideæ. Perianthium albo-viridulum 9-12 lin. longum, segmentis tubo paulo brevioribus. Antheræ 1 lin. longæ filamentis filiformibus quadruplo breviores. Stigma demum exsertum. *Montes Cameroon, alt.* 3500 *pedes*, G. Mann, 1204 !.

GROUP 7.—*Flores dense capitati. Folia petiolata oblanceolata vel oblonga.*

19. D. CYLINDRICA, *Hook. fil.*, *Bot. Mag.*, t. 5846. *Ad ripas fluminis Old Calabar*, G. Mann, 2328 ! ; Rev. W. C. Thomson !.

20. D. AFZELII, *Baker, n.sp.* Frutex copiose ramosus. Folia arundinaceo-coriacea, breviter petiolata lanceolata 5-6 poll. longa medio 12-15 lin. lata, e medio utrinque angustata viridia concoloria subtus præter apicem costata. Petioli 3-6 lin. longi. Flores in spicam subsessilem terminalem conferti. Pedicelli brevissimi apice articulati. Bracteæ deltoideæ vel lanceolatæ 2-3 lin. longæ. Perianthium 6-7 lin. longum segmentis tubo gracillimo brevioribus. *Sierra Leone*, Afzelius in Herb. Mus. Brit !.

21. D. OVATA, *Gawl. Bot. Mag.*, t. 1180. *Sierra Leone*, Afzelius.

22. D. PHRYNIOIDES, *Hook.*, *Bot. Mag.*, t. 5352. *Fernando Po*, G. Mann, 417 ! ; *Sierra del Crystal*, 1° N. lat., G. Mann, 1625 !.

23. D. BICOLOR, *Hook.*, *Bot. Mag.*, t. 5248. *Fernando Po et Old Calabar*, G. Mann !.

Species exclusæ.

Of Tropical African Species described by Thunberg and Dallmann, *Dracæna hirsuta* proves upon inspection of the type specimens, which have been kindly sent for my inspection by Professor Theodore Fries, to be *Palisota thyrsiflora*, Beauv., in *Commelynaceæ ; D. ensata* to be *Dianella ensifolia ; D. hemichrysa* to be an *Astelia ;* and *D. acuminata* to be *Cohnia macrophylla*, so that all these must be excluded.

NOTES EXTRAITES DE L'ÉNUMÉRATION DES ROSIERS DE L'EUROPE, DE L'ASIE, ET DE L'AFRIQUE.

PAR A. DÉSÉGLISE.

Sect. SYNSTYLÆ.

R. VIRGINEA, *Ripart in litt. ; R. leucochroa* b. *lactea floribus candidis* Lois., ? Notice in Desvaux Journ. (1809), vol. ii., p. 237 ; Desp., Roset. Gall., no. 2440 ?

Arbrisseau robuste, touffu, aiguillons nombreux, dilatés à la base recourbés au sommet, ceux des jeunes rameaux moins forts ; pétioles un peu velus au bord du sillon et à la naissance des folioles, quelques pétioles portent de petites glandes fines stipitées peu abondantes, aiguillonnés en dessous ; 5-7 folioles ovales-aiguës ou ovales-arrondies, *glabres*, vertes en dessus plus pâles en dessous, simplement dentées ; stipules glabres, bordées de glandes, oreillettes aiguës divergentes ; pédoncules 1-4 *glabres*, ayant à leur base des bractées ovales cuspidées au sommet, glabres, égalant ou plus courtes que les pédoncules ; tube du calice *obovoïde*, glabre ; divisions calicinales spathulées au sommet, les extérieures appendiculées à appendices un peu larges, les intérieures entières, saillantes sur le bouton, plus courtes que la corolle, réfléchies à l'anthèse, non persistantes; styles glabres en une colonne plus ou moins saillante, disque conique; fleur *d'un blanc pur même à l'onglet;* fruit rouge *sphérique.*

Hab.—Juin. Haies, bois.—FRANCE.—*Cher*, Fussy (Ripart), bois de Rouet!, Mehun! forêts de Fontmoreau!, du Rhin-du-bois!, Berry!, Boursac!, Vierzon!, Aubusset!,—*Calvados*, bois de Manerbe près de Lisieux!.

Sect. CINNAMOMÆ.

R. DISSIMILIS, *Nob.; R. cinnamomea,* Karelin et Kiril., exs., no. 560 (non Lin.), 1840.

J'ai vu dans l'herbier de M. Alph. de Candolle, un rosier distribué par MM. Karelin et Kiriloff, sous le nom de *R. cinnamomea,* qui n'est pas la plante connue sous ce nom dans les flores; il est plus voisin de *R. lucida,* Ehrh., sans être ce dernier. Voici la description que j'ai établie sur les deux spécimens qui se trouvent dans l'herbier de M. de Candolle; peut-être ce rosier a-t-il déjà reçu un nouveau nom? mais je l'ignore.

Rameau portant quelques petits aiguillons grêles, dilatés à la base en forme de disque, légèrement courbés, blanchâtres; pétioles canaliculés, inermes ou très faiblement aiguillonnés, pubérulents; 7-9 folioles coriaces, glabres, d'un vert glaucescent en dessus, blanchâtres en dessous à nervure médiane pubérulente, simplement dentées à dents ouvertes et profondes, ovales-elliptiques de moyenne grandeur; stipules étroites, glabres à oreillettes aiguës divergentes; pédoncules solitaires ou réunis 1-3 en bouquet, courts, hispides (j'ai remarqué que ceux réunis en bouquet, principalement le pédoncule central est en outre pubérulent), bractées petites ovales, glabres, cuspidées plus ou moins veinées en dessous, plus courtes ou égalant le pédoncule; tube du calice petit, sphérique, glabre (d'un rouge un peu pruineux autant que j'ai pu juger sur les échantillons secs); divisions calicinales entières, glabres, spathulées au sommet, plus courtes que la corolle, réfléchies à l'anthèse puis après redressées conniventes; styles courts, velus, couvrant presque tout le disque; fleurs . . . (difficile de dire sur le sec la couleur des pétales, qui semblent être roses?); fruit petit sphérique pas assez avancé pour juger de la persistance des divisions calicinales.

Obs.—Ce rosier a l'aspect du *R. lucida,* Ehrh., dont il diffère par ses aiguillons du ramuscule, ses pétioles pubérulents, ses folioles à côte pubérulente, ses divisions calicinales glabres, les pédoncules et ses styles.

Hab.—In sylvaticis prope Semipalantinsk (Karelin et Kiriloff in Herb. DC.).

Sect. CANINÆ, A. nudæ.

R. ADDITA, *Nob.*; *R. coricea,* Crépin (non Opiz); *R. canina,* var. b. *coriacea,* Bossier, Fl. Orient., vol. ii., p. 685.

Arbrisseau . . . , rameaux florifères d'un vert glaucescent à aiguillons purpurins ou verdâtres, dilatés à la base, plus ou moins crochus; pétioles purpurins ou verdâtres, canaliculés en dessus glabres, lisses, inermes; 5-7 folioles assez grandes, les latérales pétiolées, ovales elliptiques attenuées ou arrondies à la base, les supérieures plus ou moins acuminées, glabres, *assez épaisses coriaces, d'un* *vert glaucescent*, simplement dentées à dents assez profondes; stipules les unes purpurines ou vertes en dessous, glabres, *denticulées aux bords* à oreillettes aiguës *droites*; pédoncules longs, solitaires ou réunis 2-4 formant des bouquets de 8 et 12 fleurs, glabres, le bouquet porte à la base des bractées glabres, *ovales-lancéolées* à pointe plus ou moins foliacée, denticulées aux bords, plus longues que les pédoncules, les autres bractées sont plus petites et de même longeur que les pédoncules; tube du calice glabre, *ellipsoïde*; divisions calicinales glabres en dessous, spathulées au sommet, 2 entières tomenteuses aux bords, 3 pinnatifides à appendices entiers ou portant 1-3 petites dents, longuement saillantes sur le bouton refléchies à l'anthèse, non persistantes; styles faiblement hérissés, disque presque plan; corolle assez grande; fruit rouge, *assez gros ellipsoïde*.

Obs.—Description établie sur les échantillons de mon herbier et portant les numéros 263 et 656 de la collection Kotschy; le no. 263 a été publié sous le nom de *R. canina*, var. *uncinella;* le no. 656 sous celui de *R. canina*, L.: ce dernier est sans localité et l'étiquette porte: "loco speciali non notato."

Hab.—Juin. Région des montagnes.—PERSE.—Mont Elbrus, Passgala (Kotschy, no. 263 et 656); entre Nischapur et Mechhed (Bunge in Herb. Boissier).

R. AMANSII, *Dés'gl. et Ripart; R. Aginnensis*, Ripart (non Desp.).

Arbrisseau peu élevé à rameaux tendres et verdâtres, aiguillons comprimés à la base et crochus au sommet, ceux des rameaux florifères plus petits les uns crochus d'autres seulement courbés en faulx, souvent géminés au dessous des pétioles; pétioles canaliculés, *parsemés de poils* en dessus aiguillonnés en dessous; 5-7 folioles petites, *ovales-arrondies*, *ovales-elliptiques*, *quelques unes ovales-aiguës*, glabres, vertes, simplement dentées; stipules étroites, glabres, à oreillettes courtes, *ciliées*, bordées de glandes; pédoncules solitaires ou réunis 2-4, glabres, portant à leur base deux bractées l'une souvent foliacée au sommet, larges, ovales appendiculées au sommet, glabres, plus longues que les pédoncules, ayant aux bords quelques cils et glandes; tube du calice *petit arrondi*, lisse; divisions calicinales glabres en dessous spathulées *ciliées* au sommet, 2 entières à bords tomenteux, 3 pinnatifides à appendices 2-3 courts, égalant la corolle, refléchies à l'anthèse, non persistantes; styles libres, courts, hérissés, disque plan; fleur *petite blanche*; fruit, *petit sphérique* d'un *rouge sanguin* à la maturité.

Hab.—Juin. Haies.—FRANCE.—*Lot-et-Garonne*, Arasse près d'Agen (Garroute).

Obs.—J'ai reçu d' Angleterre, du comté Nord d'York, de M. Baker, un rosier qui se rapproche beaucoup du *R. Amansii* par ses fruits et ses styles, mais l'échantillon étant dépourvu de feuilles, je ne puis pas me prononcer définitivement.

Sect. CANINÆ, D. pubescentes.

R. JACTATA, *Nob.; R. Uncinella*, Auct., an Bess.?

Exs.—Unio itiner., année 1838? année 1839. Déséglise, Herb. Rosarum, no. 67; Billot, no. 3587.

Arbrisseau élevé à rameaux flexueux verts ou lavés de pourpre munis d'aiguillons peu nombreux dilatés comprimés à la base crochus ou inclinés au sommet; pétioles tomenteux inermes ou portant 1-3 petits aiguillons crochus; 5-7 folioles larges, fermes, ovales-elliptiques ou ovales brièvement aiguës, d'un vert clair parsemées de poils et glabres à l'état adulte en dessus, pubescentes et glauques en dessous ne conservant de la villosité à l'état adulte que sur les nervures, irrégulièrement dentées la majeure partie des folioles est simplement dentées, quelques folioles ont les dentes surchargées de dents accessoires vers le sommet, dents ciliées et terminées par un petit mucron; stipules larges parsemées en dessous de quelques poils, glabres en dessus à bords ciliées et portant quelques rares glandes, oreillettes aiguës droites ou peu divergentes; pédoncules courts, solitaires ou réunis 1-4, glabres, cachés par de larges bractées ovales-cuspidées, glabres, à bords ciliés et portant quelques fines glandes; tube du calice ovoïde lisse; divisions calicinales longues terminées en pointe large, glabres sur le dos, 2 entières à bords tomenteux, 3 pinnatifides, saillantes sur le bouton plus courtes que la corolle refléchies à l'anthèse puis redressées et non persistantes sur le fruit; styles courts hérissés disque presque plan; fleur d'un rose pâle; fruit assez gros obovoïde ou ovoïde d'un rouge vermillon.

Hab.—Juin, juillet. Haies, bois.—RUSSIE D'EUROPE.—Volhynie (Hohenacker, 1839), Tyræ (Besser!). — FRANCE. — *Haute-Savoie*, Haberes-Lullin, Haberes-Poche, Saint-Germain-sur-Talloires près d'Annéci (Puget);—*Savoie*, Puy-gros près de Chambéry (Paris);—*Isère*, forêt de Porte derrière Chamechaude (Verlot).

Obs. 1. Le *R. Uncinella*, Besser, publié par *l'Unio itiner.* in 1838 et venant du Caucase, diffère de celui publié par la même société en 1839 : par ses divisions calicinales glanduleuses sur le dos à appendices étroits, ses styles velus, les folioles sont à dents plus fines mais aussi irrégulièrement dentées; ce n'est certainement pas la plante de Besser.

Obs. 2. M. Crépin, Primitiæ Mon. Ros., fasc. 1., p. 60, dit que le *R. Uncinella* que j'ai publié n'est pas celui de Besser. Je ne conteste pas l'authenticité du type vu par M. Crépin; mais je dois dire que l'échantillon que je possède en herbier venant de Besser! de plus que les spécimens des herbiers de Candolle et Boissier étiquettés *R. Uncinella* par Besser! ne sont pas d'accord avec la description, pas un de ses types a les folioles doublement dentées: l'échantillon de l'herbier de Candolle a la majeure partie des folioles simplement dentées puis vers le sommet les dents sont surchargées de dents accessoires, les vingt folioles qui se trouvent sur l'échantillon *une seule est foliis biserratis.*

Le spécimen qui existe dans l'herbier Boissier, les folioles sont simplement dentées, pas une foliole porte une dent accessoire, les folioles sont glabres, la nervure médiane seule porte à la base des poils, les styles sont glabres, les pétioles velus inermes.

Je crois qu'on agirait prudemment en abandonnant le nom de *R. Uncinella* qui ne se rapporte pas rigoureusement à une forme tranchée mais plutôt à un groupe illimité.

Sect. CANINÆ, C. hispidæ.

R. LATEBROSA, *Nob.*; *R. occulta*, Crépin?

Port du *R. andegavensis*, aiguillons des tiges robustes, dilatés comprimés à la base inclinés ou légèrement crochus au sommet, *dégénérant sur les rameaux florifères en aiguillons fins sétacés glanduleux*, écorce vineuse ou verdâtre ; pétioles glabres, glanduleux à glandes fines, aiguillonnés en dessous ; 5-7 folioles d'un vert sombre en dessus, ovales, celles des jeunes pousses ovales-lancéolées ou ovales-elliptiques, doublement dentées, les dents principales ouvertes terminées par un mucron les secondaires par une petite glande, la nervure médiane porte quelques glandes ; stipules glabres à oreillettes aiguës droites, la partie interstipulaire glanduleuse ; pédoncules 1-2-4, les uns *hispides les autres glabres*, bractées ovales cuspidées glabres en dessus, *glanduleuses en dessous* plus longues que les pédoncules ; divisions calicinales ovales spathulées au sommet 2 entières à bords tomenteux seulement en dessous, 3 pinnatifides *glanduleuses sur le dos* à appendices un peu serrulés et bordées de glandes, réfléchies non persistantes ; styles hérissés disque un peu conique ; fruit glabre ovoïde.

Hab.—Bois, haies.—FRANCE.—*Cher*, Bois de Marmagne. ANGLETERRE.—*Devonshire*, Lane près Harestone, Brixton (Briggs).

R. ASPERNATA, *Nob.; R. saxatilis*, Bor! Fl. Cent., éd. 2, no. 678, éd. 3, no. 859 (non Steven) ; *R. aspratilis*, Crépin ? ; *R. glandulosa*, Bor., l.c., éd. 1, no. 408 excl. syn. ; *R. verticillacantha*, Baker, Mon. of British Ros., obs. p. 232.

Arbrisseau peu élevé, écorce des rameaux brunâtre ou verdâtre, aiguillons dilatés à la base droits, robustes, épars peu abondants ; pétioles glabres parsemés de glandes fines, aiguillonnés ou inermes en dessous ; 5-7 folioles ovales ou ovales-elliptiques (les folioles des jeunes pousses souvent terminées en pointe au sommet), vertes en dessus plus pales en dessous, glabres, nervures secondaires un peu apparentes, doublement dentées les dents secondaires glanduleuses ; stipules assez grandes, glabres, bordées de glandes, oreillettes aiguës dressées ou divergentes ; pédoncules solitaires ou groupés par trois, couverts de petites soies spiniformes terminées par une glande, bractées larges, ovales cuspidées, glabres, plus longues ou égalant les pédoncules ; tube du calice violacé, subglobuleux, couvert de petites soies spiniformes ; divisions calicinales spathulées au sommet, glanduleuses sur le dos, 2 entières, 3 pinnatifides, saillantes sur le bouton plus courtes que la corolle, refléchies à l'anthèse non persistantes ; styles courts hérissés ; fleur rose ; fruit rouge ovoïde.

Hab.—Haies. Juin.—ANGLETERRE.—*Devonshire*, Warleigh Wood (Briggs !)—Indiqué par M. Baker dans *Somersetshire*, près Bridgewater et Weston-super-Mare : nous n'avons pas vu d'échantillons de ces deux dernières localités.—FRANCE.—*Isère*, Le Sappey, près de Grenoble (Verlot) ;—*Nievre*, la Charité (Boreau).

Sect. CANINÆ, E. Collinæ.

R. NUMIDICA, *Grenier in litteris !*

Arbrisseau à aiguillons comprimés, très forts, recourbés. Petioles pubérulents et glanduleux, non aiguillonnés en dessous. Folioles 5-7, fermes, pétiolées, ovales-aiguës, vertes et glabres en dessus, plus pâles et pubescentes en dessous sur toute la surface ou au moins sur les nervures, doublement dentées à dents secondaires glanduleuses. Stipules lancéolées, glabres sur les deux faces. Pédoncules ordinairement en corymbe très glabres et hispides-glanduleux, munis de bractées lancéolées et glabres sur les deux faces. Tube du calice allongé, ellipsoïde-sublinéaire. Base des sépales et appendices inférieurs bordés de glandes stipitées, tomenteux en dedans, reflèchis, non persistants. Pétales d'un rosé pale dépassant le calice. Disque peu saillant, styles hérissés. Fruit . . . ?.

Obs.—Cette plante diffère des *R. corymbifera*, *collina*, *Deseglisei*, par ses folioles doublement dentées; par ses pétioles non tomenteux et très glanduleux; par ses stipules et bractées glabres; par le tube allongé du calice.—Elle diffère du *R. Friedlanderiana*, qui a aussi les folioles doublement dentées, par ses pétioles non aiguillonnés, ses folioles ovales-aiguës, le tube du calice allongé (Grenier).

Hab.—Algérie.—Haies autour de Constantine (Coste).

Sect. Eglanteriæ.

R. hemisphærica, *Herm.*, *Dissert.* (1762), p. 18, no. xiv.; Koch, Dendrol., 1, p. 226; *R. glaucophylla*, Ehrh., Beitr. (1788), 2, p. 69; *R. sulphurea*, Ait., Hort. Kew (1789), 2, p. 201; *R. lutea*, Brotero, Lusit. (1801), 1, p. 337 ex Lindley; *R. Rapini*, Boissier, Diagn. (1859), sér. 2, fasc. vi., p. 72; *R. Bungeana*, Boiss. et Buhse, Aufr. (1860), p. 84.

Icones.—Clusius, Curæ Poster., p. 13; le dessinateur a sans doute oublié de figurer les stipules? Ræssig, Die Rosen, tab. 43; Botan. Register, vol. i., pl. 46; Redouté, Les Roses (1824), livr. 1 c.; Boiss. et Buhse, l.c., tab. vi., f. 1. D'après l'autorité de Lindley je cite les gravures suivantes: Parkins., Parad., tab. 415, f. 6. Misc. Lawr., Ros., tab. 77.

Exsic.—Seringe, Décade ii., no. 13; Balansa, Plantes d'Orient (1857), no. 1171; Tchihatchef (1858), no. 212 in Herb. Boissier; Buhse (1847), no. 341, in Herb. Boissier.

Hab.—Mai. Haies. — Phrygie.—*Ouchak* (Balansa); *Galatie*, Mont Elmadagh (Boissier); *Cappadoce*, Césarée (Balansa); *Arménie*, Erzinghen (Tchihatchef in Herb. Boissier); *Perse boréale*, Mont Elbrus (Buhse in Herb. Boissier).

Obs. 1. Je possède en herbier la plante distribuée par Balansa et de plus j'ai pu voir dans la collection de M. Boissier les échantillons provenant des diverses localités citées. En 1871, Reuter me fit don de magnifiques spécimens du *R. Rapini* cultivé à Valeyres dans le jardin de M. Boissier. C'est en présence de ces matériaux que je me suis convaincu que le *R. Rapini* n'était pas autre chose que le *R. hemisphærica* à fleur simple, de plus M. Boissier, à qui j'ai soumis mes observations, partage mon opinion; je suis heureux de me trouver d'accord avec l'illustre auteur de la Flore d'Orient.

M. Boissier en décrivant dans ses diagnoses le *R. Rapini*, se basait sur la plante spontanée et distribuée par Balansa, mais à cette époque le *R. Rapini* n'était pas encore cultivé ou s'il l'était n'avait pas encore donné des fleurs; depuis une observation plus attentive portée sur la plante cultivée à Valeyres, fait voir qu'il faut regarder le *R. Rapini* comme étant le type à fleur simple du *R. hemisphærica;* M. Boissier dans sa Flore d'Orient partageait déjà cette opinion.

La plante spontanée a les stipules entières, les folioles à dents composées et non doublement dentées, les unes à dents simples les autres à dents doubles, légèrement pubescentes en dessous, les divisions calicinales entières courtes terminées en pointe : caractères qui font croire à un type différent du *R. hemisphærica*, mais il n'en est rien.

Le *R. Rapini* cultivé a éprouvé de grandes modifications en changeant de climat et a pris pour ainsi dire les allures du *R. hemisphærica* : 1° les aiguillons sont devenus plus grêles : 2° la villosité des folioles a disparu, quelques poils épars se rencontrent sur la nervure médiane, les folioles sont devenues 2 ou 3 fois plus grandes et ayant presque toutes une forme obovale avec une serrature irréguliére plus ou moins profonde au sommet comme dans les feuilles figurées in Bot. Reg., v. i., t. 46 ; 3° les divisions calicinales de simples qu'elles étaient primitivement sont devenues appendiculées, les extérieures ont pris un développement très grand, elles sont larges et denticulées au sommet comme dans les divisions calicinales du *R. hemisphærica* cultivé dans les jardins ; 4° enfin les stipules d'entières qu'elles étaient dans les échantillons distribués par Balansa sont devenues denticulées !

Il serait curieux de resemer dans son lieu natal le *R. Rapini* provenant de graines du jardin de Valeyres pour voir s'il reviendrait à son premier type en rechangeant de climat ou s'il resterait tel quel ? Je dis plus il serait très intéressant de resemer en Orient le *R. hemisphærica* provenant de nos jardins.

Obs. 2. J'adopte le nom de *R. hemisphærica* comme étant le plus ancien, il date de 1762—celui de Aiton est de 1789—je sais à l'avance que le nom de *R. sulphurea*, plus significatif, restera de préférence dans le langage horticole ou botanique à celui de *R. hemisphærica*, mais la nomenclature botanique a ses lois que chaque phytographe doit suivre, n'étant nullement autorisé à changer un nom sous prétexte qu'un autre est meilleur ou plus connu.

Obs. 3. C'est à Clusius qu'on doit l'introduction de cette plante dans les jardins en 1605 où elle fut plantée à cette époque, dans le jardin de l'Académie de Leyde ; on ne connaissait point avec certitude la patrie de cette espèce—on la supposait originaire d'Orient.

Introduite en Angleterre en 1629 par John de Franqueville ; j'ignore la date de son introduction en France. Desportes, Thory et Redouté n'en font aucune mention, pas plus que le Dictionnaire des Sciences Naturelles, vol. xlvi.

Garidel, Histoire des Plantes de la Provence (1719), p. 405, dit en parlant du *Rosa lutea multiplex*, C. Bauh. ; *Rosa flava plena*, Clusius, Hist., 114 : " Cette espèce est assez commune dans notre terroir." Ce qui ferait croire pour cette époque déjà à une ancienne culture, car nous ne pouvons pas admettre que ce rosier soit natif de France.

L'aire géographique du *R. hemisphærica* s'étendrait à travers l'Asie-Mineure, l'Arménie et jusque dans le nord de la Perse.

ON A NEW SPECIES OF *FLUGGEA* FROM THE EAST HIMALAYAS.

By J. G. Baker, F.L.S.

Fluggea dracænoides, *Baker*, *n.sp.*, suffrutex scandens foliis petiolatis oblanceolatis, racemis paucifloris laxifloris, pedicellis infimis solitariis vel geminatis.

Subtemperate region of Sikkim and Khasia, in woods at an altitude of 4000 to 6000 feet.—*Dr. Hooker* and *Dr. Thomson*.

Stems wide-scandent, firm, woody, clothed with the rather close membranous bases of the fallen leaves, and sending out branches, which, like the tip, produce a close tuft of 3-6 leaves from the centre of which the scape issues; blade oblanceolate, 3-4 inches long, 9-15 lines broad above the middle, cuspidate, narrowed very gradually into a distinct petiole 1-3 inches long, similar to those of a *Dracæna* in texture, with 20-30 distinct parallel ribs, showing a distinct fine midrib from base to apex, full green above, pale green below, quite glabrous; scape slender, naked, 1-3 inches long; raceme lax, secund, 2-3 inches long, 12-20 flowered; pedicels all solitary, or the lowest sometimes geminate, finally 1½-2 lines long, jointed about the middle; bracts lanceolate, equalling or slightly exceeding the pedicels; perianth ¼ inch deep, whitish or pale lilac, the lanceolate divisions three or four times as long as the campanulate tube; anthers lanceolate, half as long as the perianth segments, with a short ligulate filament inserted into the back a little above the base; berries 1-3 to a flower, distinctly stalked, bluish, oblong, half an inch deep.

This is an interesting addition to this curious genus, in which the two species already known (which Kunth has multiplied to six) are both acaulescent herbs with a dense basal tuft of graminoid leaves. This plant has entirely the general habit and leaves of *Dracæna elliptica* with flowers precisely like those of *Fluggea japonica* (Bot. Mag., t., 1063) in structure and appearance. My own view, contrary to that of those who have written lately on *Ophiopogoneæ*, is to keep up *Fluggea* as a genus distinct from *Ophiopogon*, for which latter *Liriope* of Loureiro is a name that takes precedence by eighteen years. *Liriope* simply differs from *Anthericeæ* by the berry-like seeds bursting the ovary in an early stage and growing and ripening whilst exposed to the air, like those of *Caulophyllum* in *Berberidaceæ*, but *Fluggea* and *Peliosanthes* recede from *Liliaceæ* by their half-inferior ovary, and the latter has a corona from the throat of the tube like *Narcissus*, inside the rim of which the subsessile stamens are fixed. *Dracæna graminifolia*, of Linnaeus, is the same plant as *Ophiopogon spicatus* of Gawler.

DICRANUM UNDULATUM, *Ehrh.*, AS A NATIVE OF ENGLAND.

By Henry Boswell.

Much has been said and written during a long time past on the supposed discovery of *Dicranum undulatum*, Ehrh., in Britain, and from time to time I have received from various friends and correspondents specimens purporting to be that moss; but however specious their first appearance might be they all alike broke down on the slightest examination, and could not be suffered to pass muster as the genuine thing; all alike failed to possess the true characteristics of the species, and so were laid aside.

At the beginning of last year a more important attempt was made to fix the moss in question as a native of England, in a note* bearing the well-known name of Dr. Braithwaite, and quoting the high authority of Dr. Lindberg, in support of the authenticity of specimens gathered long ago in Stockton Forest, Yorkshire, by Mr. Spruce, and again lately in the same place by another collector. This, of course, made the matter much more serious, and rendered the full investigation of the subject more necessary, as from the eminent position of those gentlemen in the botanical world, their opinion is entitled to much consideration, and likely to carry great weight in the minds of inquirers, or even to pass unquestioned, and so if any mistake should be made there is the risk of a species not really native obtaining an undeserved place in the British list.

The half-promise of a return to the subject with which the article alluded to concluded has never been fulfilled; nor have any of our numerous collectors, so far as I know, come forward to offer us any information upon the point. I should probably have waited longer for some abler hand to take the matter up in a final way and end all doubts by fully elucidating the question, but that having lately received from two different correspondents specimens of the moss gathered lately in Stockton Forest by Mr. Anderson, and greatly misdoubting their first aspect, I have been led to study them closely and compare them with authentic fruiting specimens of *Dicranum undulatum* from Switzerland, Germany, the Vosges, and North America, as well as with various specimens of *Dicrana* of English growth. The result may be stated in short space, and if I am not altogether mistaken, will disappoint all who have come to believe or hope that this fine species—one of the handsomest of the handsome genus to which it belongs—has really ever been found in this country; and the puzzling question will still remain why *D. undulatum*, though found both in North America and on the European continent, is wanting in England, as in the very similar cases of *Orthotrichum speciosum*, *O. Braunii*, *Hypnum reptile*, and some others.

On a thorough examination it will be found that the Stockton Forest plant is only a variety, and but a slight one, of the well-known and widely-spread *Dicranum palustre*, which has grown in a dry place and has its leaves somewhat contorted or crisped, and a good deal more strongly undulated than usual; and to *D. palustre* it is to be feared will have to be referred all the British-grown specimens bearing the name of *D. undulatum*, with the exception of some two or three, which appertain unmistakably to *D. scoparium*.

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* "Grevillea," vol. i., p. 108.

For the sake of distinction the present moss might be called variety *rugifolium*, if it be thought worth while to take so much notice of a plant that occurs only in a barren state, and probably owes such characters as it possesses entirely to local influence. A very similar form of the same species, and almost as strongly marked, has been gathered repeatedly by my friend, Mr. Barnes, in Westmoreland, where it grows upon dry limestone rocks; a very singular habitat for a species called *palustre*.

When barren mosses are under consideration it is very difficult to name them rightly, and very easy to fall into a mistake; but if I have rightly apprehended the plants in question and their proper features, the following characters will render it at all times easy to distinguish *D. palustre* from *D. undulatum*, and to determine even a barren tuft. *D. scoparium* is so well discriminated from *D. palustre* in "Bryologia Britannica" that more need not be said, but these two species are in fact a great deal more liable to variations than is generally thought, and they deserve attention from collectors.

Dicranum palustre: tufts dense, soft, easily yielding when compressed by the hand; stems weak, flaccid; leaves erecto-patent and spreading, linear lanceolate, their basal angles narrowly rounded, their apices with saw-like teeth, their texture soft, flaccid; the areolæ lax; undulations varying much, being sometimes strong and obvious, sometimes almost obsolete; fruitstalks solitary, capsules subcernuous, suberect.

D. undulatum: tufts more lax, incoherent above, firm and strong; stems strong and woody; leaves widely spreading and recurved, linear lanceolate above, oblong below, their basal angles cordate and decurrent, apices with long spinulose teeth, texture firm and strong; areolæ close, elongated, and narrow, undulations more regular; fruitstalks generally about four or five from a flower; capsules arcuate, nearly horizontal.

Of course there are other characters: I only give the salient points, most of them requiring nothing more than the unaided eye to see them. The authors of the "Bryologia Europæa" speak of the tomentum which covers the stem of *D. palustre* as sometimes whitish; but in all the specimens that I have seen it is rusty-red or rusty-brown. In *D. undulatum* besides being much more copious it seems as far as my specimens extend to be white on the new stems and innovations, turning dark brown and blackish on those of past seasons. Probably this is a character that varies.

NOTE ON *SPATHODEA CAUDA-FELINA.*

BY HENRY F. HANCE, PH. D., ETC.

WHEN describing this plant,* I stated that its flowers were destitute of the rudiment of a fifth stamen, in which respect it disagrees with the African *Spathodeæ*, and with the plants separated under the names of *Dolichandrone* and *Muenteria;* but, in extenuation of this difference, I remarked that *Diplanthera* comprises species both with and without an imperfect fifth stamen. My description was entirely correct, so far as regards the flowers I examined, but I have since discovered that the character is quite inconstant. In a number of fresh flowers which I have examined during the past two winters, at Canton, where the tree blossoms annually in November and December, I find some, like those originally described, without a trace of a staminode, others with a perfectly conspicuous one, about 2½ lines long, subulate in form, and coloured red like the filaments of the antheriferous stamens. This does not arise at a higher level than the fertile stamens, as is the case in *Spathodea* (*Dolichandrone*) *crispa*, Wall., according to Bureau's figure,† but is inserted on the same plane, as in *S.* (*Newbouldia*) *lævis*, Beauv., and *S.* (*Radermachera*) *glandulosa*, Bl.‡ The presence or absence of this rudimentary organ, not merely in allied species, but in flowers of one species from the same tree, affords a very convincing demonstration of the slight importance to be attached to the character in the classification of *Bignoniaceæ*, and I have therefore thought it worth while to give publicity to my observation.

A NEW CHINESE *HYDRANGEA.*

BY H. F. HANCE, PH.D., ETC.

Hydrangea (*Euhydrangea, Petalanthæ*) *Moellendorffii*, sp. nov., suffruticosa, subsimplici, foliis elliptico-oblongis acuminatis 2-4 poll. longis basi (summis exceptis) in petiolum brevem sensim cuneato-decurrentibus serratis utrinque cum caule pilis basi bulbosis strigillosis subtus pallidioribus, cymis terminalibus laxiusculis, floribus radiantibus paucis disepalis, sepalis membranaceis reticulo inconspicuo æqualibus albidis orbicularibus exunguiculatis 2-3 lin. longis, fertilium dentibus calycinis ovatis acutiusculis patenti-reflexis, petalis obovatis subreflexis purpurascentibus, stylis 2-3 crassis erecto-patulis, ovarii minuti vertice vix e tubo calycis exserto.

In collibus circa Kiu kiang, prov. chinensis Kiangsi, d. 3 Oct., 1873, leg. Dr. O. F. von Moellendorff. (Herb. propr., n. 18061.)

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* Journ. Bot., x., 258. † Bureau, "Monogr. Bignoniac.," t. 27.
‡ Ejusd. op. tt. 15, 28.

This interesting plant is closely related to *H. hirta*, Sieb. & Zucc. !, but differs by its less coarsely-toothed leaves, very conspicuously produced at the base, the presence of radiant flowers, and the shape of the petals. One of my specimens is an entire plant, and is less than a foot in height. I have not had an opportunity of comparing the fruit with that of the Japanese species.

BOTANICAL BIBLIOGRAPHY OF THE BRITISH COUNTIES.

By Henry Trimen, M.B., F.L.S.

(*Continued from page* 112.)

Lincoln.—[53 South; 54 North; artificially divided. Pr. Trent.] Chiefly drained by Witham, &c., into the Wash; N. portion into Humber; part of E. by small streams into German Ocean.

1.—No complete Flora.

2.—Gibs., 482.—Mart., 64.—Gough, ii., 282.—B. G. 385.—New B. G., 271.—J. Britten, List in White's History of L., 1872. List of books quoted given.

Gainsborough.—Wollaston in Phyt., i., 522.—Anderson's Guide, 1847.

Winterton.—W. Fowler in Phyt., N.S., 1858, 331.

Frieston.—Howitt in New B. G., ii., 651.

3.—Sir J. Banks' plants in British Museum.

Leicester and Rutland.—[55. Pr. *Trent.*] Chiefly drained by Trent; S. E. part, including most of Rutland, by Welland into the Wash; small piece of S. by Warwick Avon (Severn).

1.—Mary Kirby, Flora of L., 1850. Natural System. No districts. Cryptogams not included.—W. H. Coleman in White's Directory of L., 1863. Based on lists for 12 districts "taken from physical geography and river drainage." No Cryptogams. No special localities. List of previous writers given.—Cryptogams, A. Bloxam, MS. in Bot. Dep., Brit. Museum.

2.—Mart., 61.—Gough, ii., 215.—B. G., 374.—New B. G., 177, 607.—J. Curtis, History of L., 1831.—Mosses, list of (72) species presented to L. Museum by J. F. Hollings.—Pulteney in Phil. Trans., XLIX., pp. 803, 866, 1757.

Loughborough.—Pulteney, MS. Flora with coloured drawings, 1747, in Leicester Museum; another, 1749, in library of Linnean Society; an abridgment of the first in Bot. Dep. Brit. Museum.

Leicester, Loughborough and Charley Forest.—Rarer plants in vol. 1 of Nichols' Hist. of L., 1796, pp. clxxvii—cxc. Includes Cryptogams.

Belvoir, Vale of.—Rev. G. Crabbe in Nichols' History of L., vol. i., 1795, pp. cxcvi.—cc.

Charnwood Forest.—A. Bloxam and Ch. Babington in appendix to Potter's Ch. F., 1842. Includes Cryptogams.

Bradgate Park.—Description of B.

3.—Pulteney's plants in British Museum.—Herbarium at Leicester Museum.

RUTLAND.—B. G. 509. New B. G., 176, 67. Gough, ii., 224*.

NOTTINGHAM.—[56. Pr. *Trent.*] Nearly entirely in Trent basin, a small portion of E. drained by Witham into the Wash.

1.—Ordoyno, Flora Nottinghamiensis, 1807. Linnean Order. No districts. Cryptogams not included.—G. Howitt. The N. Flora, 1839. Natural System. Includes Cryptogams.

2.—Gibs., 490.—Mart., 83.—Gough, ii., 295.—B. G., 482.—New B. G. 265., 640.—Pulteney in Phil. Trans., XLIX., pp. 803, 866, 1757.

Nottingham.—Deering, Catalogus stirpium, &c., more especially about N., 1738.—Alphabetical, names of Ray's Synopsis, ed. 3.—Ib., list of scarce plants in Historical Account of N., 1751.—Sidebotham in Phyt., i., 78, 365.—Howitt & Valentine, Muscologia Nottinghamiensis, 1833.

The *Loughborough* Floras and Crabbe's Vale of Belvoir contain localities (see LEICESTER).

A Flora said to be in preparation by Rev. E. Smith and Mr. Irving.

DERBY.—[57. Pr. *Trent.*] Almost entirely in Trent basin; small part in N. W. Mersey basin.

1.—No complete Flora.

2.—Gibs., 498.—Mart., 46.—Gough, ii., 325.—B. G. 181.—New B. G., 259, 636.—Glover's History of D., 1831, vol. i., pp. 86, 112. Includes Cryptogams.

Breadsall.—Whittaker in Phyt., ii., 901.

Repton.—Wyatt & Thornton, Flora Repandunensis, the wild flowers of R., 1866.

Tutbury & Burton-on-Trent.—Flora of district round, in Sir O. Mosley's Nat. Hist. of T., 1863.

Matlock & Buxton.—List of plants in "Gem of the Peak," ed. 5, 1851.

The Peak.—C. Leigh, Nat. Hist. of Lancashire, Cheshire, and the Peak, 1700.—J. Martyn in Phil. Trans., XXXVI., (1731) p. 22.

CHESTER.—[58. Pr. *Mersey.*] Entirely in Mersey and Dee basins.

1.—No complete Flora.

2.—Gibs., 571.—Gough, ii., 440.*—B. G., 109.—New B. G., 254, 635.—C. Leigh, Nat. Hist. of Lancashire & C., 1700.—Rubi, J. L. Warren in Journ. Bot., 1869, 353.—J. L. Warren, Notes on a projected Cheshire Flora, 1873, privately distributed.

Warrington.—G. Crosfield, Calendar of Flora, 1809.—Phyt. N.S., vi., 449.—W. Wilson, MS. notes in copy of Galpine's Compendium in Bot. Dep., Brit. Museum.

Knutsford.—Old localities, Phyt. i., 700.

Frodsham.—J. F. Robinson in Phyt. N.S., iii., 193.

Manchester & Liverpool Floras contain many localities in this county. (See LANCASTER.)

3.—Herbarium at Warrington Free Museum and Library.

A complete Flora is in preparation by Hon. J. L. Warren & F. M. Webb.

LANCASTER.—[59 South, 60 West*; separated by R. Ribble. Pr. *Mersey.*] Drained by Mersey, Ribble, Lune, and other smaller rivers, into Irish Sea, very small portion in E. in Humber basin.

1.—No complete Flora. List of common plants very incomplete for W. Lancaster, Watson.

2.—Gibs., 804.—Mart., 60.—Gough, iii., 145.—B. G., 365.—New B. G., 299, 659.—Leigh's Nat. Hist. of L. & Cheshire, 1700.

Manchester.—J. B. Wood, Flora Mancuniensis, 184.—L. H. Grindon, the M. Flora, 1859: popular, descriptive; no districts. Includes Cryptogams.—R. Buxton, Bot. Guide to M., ed. 2, 1859. 18 miles radius. Linnean System. Includes Musci and Algæ.—Wood in Phyt., i., 278.—Grindon in Journ. Bot., 1872, 305.—Mosses; Sidebotham in Phyt., i., 742; Hunt in Rep. of M. Field Nat. Soc., 1864.

Liverpool.—J. B. Hall, Flora of L., 1840. 10 miles radius. Cryptogams not included. Good map.—J. Dickinson, Flora of L., 1851, and in Proc. Lit. & Phil. Soc. L., 1859, and Flora of L. pub. by L. Nat. Field Club, 1872. 15 miles radius, includes *Southport*, excludes portion of Flintshire.—Supplement, 1873.—Fisher in Trans. Lanc. & Chesh. Hist. Soc.—Cryptogams; Marratt & Higgins in Proc. Lit. & Phil. Soc. L., 1855, 58, 60.

Southport.—J. Windsor in Phyt., N.S., 1863, 417.—Concise History of S.

Bury.—R. H. Alcock in Rep. B. Nat. Hist. Soc., 1871. 15 miles radius. List. Few localities.

Preston.—C. J. Ashfield, Flora of P. in Trans. L. & Cheshire Hist. Soc., 1858-64, in 4 parts.

Lytham.—Buckley in Phyt., i. 165.

Silverdale.—C. J. Ashfield in Bot. Chron., pp. 73, 96.

Warrington Lists contain localities in the county (see CHESTER).

3.—Herbarium at Liverpool Botanic Gardens.

YORK.—[61 South-East, 62 North-East, 63 South-West, 64 Mid-West, 65 North-West. Divisions artificial, partially corresponding with political ones. Pr. *Humber.*] Mainly in Humber basin, N. part in Tees, E. coast drained by several small streams into North Sea, W. portion in basin of Ribble.

1.—H. Baines, Flora of Y., 1840. No districts. Includes Mosses. Map of Teesdale.—Supplement, 1854; Flg. Plants by J. G. Baker; Mosses by J. Nowell.—Mosses, Spruce in Phyt. ii., 147.

2.—Gibs., 768.—Mart., 106.—Gough, iii., 98.—B. G., 663.—New B. G., 274, 651.—J. Atkinson in Trans. Wernerian Soc., v.

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* N. Lancaster is put with Westmoreland.

(1824), 277.—Miall & Carrington, Flora of W. Riding of Y., 1862.—J. G. Baker, N. Yorkshire, 1863. Nine districts founded on drainage. Full account of Physical Geography. List of authors quoted given.—J. Backhouse in Phyt., i., 1065, 1089, 1126.—Ferns, Newman in Phyt., i., 449.—Whitaker's Hist. of Richmondshire, i., pp. 414-418.

Whitby.—List in Young's History of W.

Scarborough.—W. Travis, Cat. plant. circa S. sponte nasc., 1800? —List in Theakston's Guide to S., 1841, and subsequent editions. Includes Algæ.

Castle Howard.—Teesdale in Trans. Linn. Soc., ii., 103; v., 36. —Ibbotson in Phyt., i., 577, 781.

Cleveland.—Lichens, W. Mudd in Phyt. v., 71, 97.

Eskdale.—Mosses, R. Spruce in Phyt., i., 540.

Settle.—W. Curtis, Catalogue, 1782 (reprinted in Phyt. N.S., i., 36, 84, 108).—Tatham in Phyt., i., 87.—Windsor in Phyt, N.S., i., 145, 173, 259, 263; ii., 12; iii., 423, 464.

Askern.—E. Lankester, Account of A., 1842, pp. 50-57.

Sheffield.—Hunter's Hallamshire, ed. by Gatty, 1869, p. 10.

Doncaster.—J. E. Kenyon in Bot. Chron., p. 76.—Fungi, Bohler in Phyt., N.S., iii., 198.

Adwick.—P. Inchbald in Phyt., iii., 445.

Halifax.—J. Bolton, Catalogue in J. Watson's Hist. of H., 1775. —Id., History of Funguses about H., 1788-91.—S. King, in Phyt., i., 1096.

Pontefract.—G. Roberts in Naturalist, i., 255, ii., 194.

Wakefield.—T. W. Gissing, Materials for Flora of W., 1867. Appeared previously in Naturalist, 1865-6.--Ib., Ferns of W., 1862.

Huddersfield.—Hobkirk in Hist. of H., 1859.—Ib., 1868.—G. Roberts in Naturalist, ii., 195.

Leeds.—F. A. Lees in Journ. Bot. 1873, 67.

Bradford.—J. Willis in Journ. Bot. 1874, 10.—F. A. Lees in Journ. Bot., 1874, 78.

Wharfedale.—Mosses, S. Gibson in Phyt. i., 291.

Richmond.—J. Ward in Guide to R.

Vale of Mowbray.—J. G. Baker in Grainge's V. of M.

Craven District.—Appendix to Whittaker's Hist. of C., 1805. Includes Cryptogams.—G. Roberts in Naturalist, ii., 182.

3.—Herbarium at Sheffield. Herbarium at York Museum formed by Dalton, Backhouse, &c.

DURHAM.—[66. Pr. *Tyne.*] Drained by Tyne, Wear & Tees. A few small streams flow direct into N. Sea.

1.—N. J. Winch, Flora of Northumberland & D., 1831.—Addenda, 1836.—J. G. Baker, New Flora of N. & D., 1868. D. divided into three districts by drainage. Authorities quoted given. No Cryptogams.

2.—Gibs., 786.—Gough, iii., 125.—B. G., 239.—New B. G., 319, 663.—Robson, Plantæ rariores agro Dunelmensi indigenæ (privately printed).—Winch, Botanist's Guide to Northumberland & D., 1805-7.—Ib., Essay on Geographical Distrib., 1819 & 1825.—Ib., Remarks on Distribution, 1830.—G. Ornsby, Sketches of D., 1846, pp. 210-216.—Trans. Tyneside Nat. Field Club, 1848 & seq.—See How's Phytologia, 1650.

Stockton-on-Tees.—Hogg, Nat. Hist. of Vicinity of S., 1827.—Ballast-flora of S., Winch in Trans. Nat. Hist. Soc.; Norman in same; M. A. Lawson in same, v.; Hogg in Ann. Nat. Hist., 1867, & Journ. Bot., 1867, 47.

NORTHUMBERLAND.—[67 (= Tyneland, J. G. Baker), 68. Cheviotland. Pr. *Tyne.*] Chiefly in Tyne basin, N. W. part in Tweed basin. Coquet and many smaller streams flow directly into N. Sea.

1.—N. J. Winch, Flora of N. & Durham, 1831.—Addenda, 1836.—J. G. Baker, & G. R. Tate, New Flora of N. & D., 1868. N. divided into eight districts by drainage. Authorities quoted given.

2.—Gibs., 876.—Mart., 83.—Gough, iii., 261.—B. G, 467.—New B. G., 337, 665.—Winch, Bot. Guide to N. & Durham, 1805-7.—Ib., Essay on Geogr. Distrib., 1819 & 1825.—Ib., Remarks on Distrib., 1830.—Trans. Tyneside Nat. Field Club, 1848 & seq.—See W. Turner's Names of Herbes, 1548, and Herball, 1551-1568, and J. Wilson, Synopsis of Brit. Plants, 1744.

Eastern Borders.—G. Johnston, Botany of E. B., 1853. Cryptogams, Hardy and Jerdon, in Proc. Berw. Nat. Club, 1853, 65, 69.

Cheviots.—G. Tate, in Trans. Berwick Club.

Alnwick.—G. Tate, History of Alnwick, 1869. Mosses by Middlemas.

Holy Island.—W. Richardson, in Phyt., N.S., v., 10.

Berwick-on-Tweed.—J. V. Thompson, Cat. of Plants in Vicinity of B., 1807.—G. Johnston, Flora of B., 1829-31. Linnean System. Descriptive. Includes Cryptogams.

3.—Winch's plants partly at Newcastle, partly at Linnean Society; Robertson's in Newcastle Museum; Prof. Oliver's in University College, London.

WESTMORELAND.—[69, including *N. Lancaster.* Pr. *Lakes.*] Drains into the Irish Sea.

1.—No complete Flora.

2.—Gibs., 817 & 846.—Mart., 102.—Gough, iii., 164.—B. G., 638.—New B. G., 304, 660.—T. Lawson, Letters to Ray, 1688, in Ray's Letters, ed. by Derham (1718), p. 213. Alphabetical list; contains also localities in other Northern counties. Modern names appended by Babington in Ray Soc.'s reprint (1846), p. 197.—T. Lawson, in Robinson's Nat. Hist. of W. & Cumberland, 1709.—J. Ottley, Concise Description of English Lakes, ed. 4, 1830.—H. Martineau, Guide to the Lakes, 1855.—Lynn Linton's Guide to Lakes, 1861.—Black's Guide, 1868.—Montane Plants, Baker in Journ. Bot., 1871, 260.

Kendal.—T. Gough, in C. Nicholson's Annals of K., 1832, pp. 221-225.—J. Nicolson, Hist. of W. & Cumberland, 1777, vol. ii., 587.

Cartmell & Furness.—Aiton in Jopling's Sketch.

Mr. J. G. Baker, of Kew, is preparing a Flora of the Lake District. Miss Hodgson is preparing a Flora of Lake Lancashire.

CUMBERLAND.—[70. Pr. *Lakes.*] Drained by Eden into Solway Firth and other streams into Irish Sea. Small part of S.W. in Tyne basin.

1.—No complete Flora.

2.—Gibs., 846.—Gough, iii., 206.—B. G., 143.—New B. G., 310, 661.—Robinson's Nat. Hist. of Westmoreland & C., 1709.—W. Richardson, in Hutchinson's Hist. of C., 1794. vol. i., pp. 39-43.—Winch, Remarks on Flora of C., 1825.—Ib., Contributions to Flora of C., 1833.—J. Woods, Bot. Excursion to N. of England in Companion to Bot. Mag., i., 288 (1835).—Lynn Linton's Guide to Lakes, 1861; good list.—Black's Guide to Lakes, 1868.

Gosforth.—J. Robson in Phyt. v., 1 (1854).

Carlisle.—J. Nicholson's Hist. of Westmoreland & C., vol. ii., p. 591, 1777.

ISLE OF MAN.—[71.]

1.—No complete Flora.

2.—New B. G., 407.—Winch, Contrib. to Flora of Cumberland, 1833.—E. Forbes, in Cumming's Isle of Man, 1848, pp. 360-364.—Phyt., N.S., iv., 161; list of rarer species.—Mosses, Davies, in Phyt., N.S., ii., 20, 109.

Mr. J. F. Robinson, of Frodsham, Cheshire, is preparing a Flora.

(*To be continued.*)

SHORT NOTES.

NATIVE COUNTRY OF SERISSA. — In his elaborate revision of *Rubiaceæ*, in the last instalment of the "Genera Plantarum," Dr. Hooker writes, under *Serissa*: "Species unica, in hortis Indiæ, Chinæ, et Japoniæ culta, nullibi indigena hactenus reperta." I am happy to be able to dispel the doubts of my learned friend as to the native country of this plant, by the statement that *Serissa fœtida* grows abundantly, and beyond all question truly wild, on the boulder-strewn hills round Amoy, where in October, 1857, I gathered a number of specimens in flower, some of which I feel sure must have gone to Mr. Bentham at Kew. I have just inspected one retained for my own herbarium, and it is precisely like cultivated ones obtained at Canton, where, by reason of its patient endurance of a vast amount of cutting and twisting about, when delivered to the tormentors, the plant is a great favourite in the gardens of the Chinese, with whom the *opus topiarium* is a passion. I know of no native *Rubiacea* at all like *Serissa*, with the exception of *Leptodermis oblonga*, Bge., which—in the dried state at least, for I have not seen it growing—has some superficial resemblance, though readily distinguishable by its larger indistinctly veined leaves, entire stipules, inflorescence, larger flowers, and five stigmas; and which appears besides to be exclusively confined to the extreme north of China.—H. F. HANCE.

ERYTHROSTAPHYLE VITIGINEA.—Professor Oliver has been so good as to point out to me that the plant I described (Journ. Bot., xi., 266) under the above name is a species of *Iodes*, closely allied to the Sumatran *I. tomentella*, Miq. I have to express my regret for the error into which I fell, and from which a reference to the "Plantæ javanicæ rariores" would have saved me. I can only plead that the genus is one not readily discoverable in a "Systema"; and that the affinities of it and its allies have been variously misunderstood by eminent botanists. A comparison of my character with that assigned to *Iodes* in the "Genera Plantarum" will I trust show that my examination was neither hasty nor inexact.—H. F. HANCE.

DISTRIBUTION OF CYNOMORIUM COCCINEUM, *Linn.*—In a notice of Henderson and Hume's work, "Lahore to Yarkand," at p. 218 of the last volume of this Journal, this plant is said, prior to its discovery, by the authors just named, on the banks of the Arpalik river, where the Yarkand plains begin, to have been "only known in the Mediterranean region and North Africa." This is an error. In the concluding portion of Regel and Von Herder's "Enumeratio plantarum in regionibus cis- et transiliensibus a Semenovio collectarum," published in the "Bulletin de la Soc. Imp. des nat. de Moscoue" for 1868, *Cynomorium* is catalogued as having been gathered by Semenow, in June, 1857, on sandy ground in the Ili Valley, at an elevation of 1000 feet. And the late Dr. Ruprecht, in his "Sertum Tianschanicum," (Mém. Acad. St. Pétersb., 7e sér., xiv., n. 4), records its collection, by Schrenk, in the salt plains of Songaria, at Lake Balkash, (which I may mention is 7° north of Yarkand); and in the Koschkar Valley, to the west of Lake Issyk-Kul, (N. lat. 42° 15′, E. long. 75° 25′), on the 24th July, 1867, by Baron F. v. d. Osten-Sacken, who, in the introductory narrative to this memoir, says that a single specimen only with ripe fruit was gathered by a Kirghiz. Besides these three precise localities, the plant is included in the "Index floræ Mongolicæ," printed at the end of Maximowicz's "Primitiæ Floræ Amurensis," fifteen years ago.—H. F. HANCE.

PLANTAGO LANCEOLATA.—I enclose a singular variety of *P. lanceolata*, which I picked up a few days ago, in which the heads are unisexual, the stamens in many of the flowers being converted into petals, while in others, the anthers are on very short filaments and barren, altered also in shape, having two horns at their base. The true divisions of the corolla are also altered in shape and instead of being reflexed in flowering, they are erect and connivent. The styles are much elongated and there are sometimes four ovules in the ovary.—N. A. DALZELL.

CORYDALIS CLAVICULATA IN CO. DERRY.—I enclose a specimen of the above, two good-sized patches of which I found on April 23rd, bearing both flowers and fruit, on a gravelly roadside bank in Culmore, County Londonderry (or from a more strictly geographical point of view County Donegal). The only locality in Ulster hitherto doubtfully recorded, so far as I know, for this species is Warrenpoint County Down. I think that no doubt need be entertained as to the genuineness of the present locality, though it is strange that it should have been hitherto overlooked.—W. E. Hart.

Abnormal Stapeliæ.—Is it known that the *Stapeliæ* are rather subject to variegation from the typical 5-partite perianth? Sir H. Barkly told me last year that one of the species common near Ca e Town (*S. variegata*, I believe) had borne 6-parted flowers, and he showed me the withered remains of the flowers in question. Quite recently the same plant has again produced flowers of this abnormal description, which seems to point to a constant tendency in this direction of certain individual plants. There is a long row of this common species growing in the Botanic Garden, and on a careful examination of all the flowers, I found a solitary 6-rayed one. I send a rough sketch of this flower. The division into 6 extends to the calyx as well as to the sexual organs. Sir H. Barkly has found in a closely allied species, one 6-rayed and another 7-rayed flower; and I have met with a small species (also in cultivation in the gardens) one of whose flowers was strictly and evenly 4-parted throughout.—Roland Trimen.

Asexual Reproduction of Ferns.—In a communication to the American Academy of Sciences, printed in its Proceedings (1874, p. 68), Dr. W. G. Farlow describes the asexual growth of young plants from the prothallus of *Pteris serrulata*. The anomaly was observed in the botanical laboratory at Strasburg, in about fifty cases. The growth was seen to commence by the formation of scalariform vessels in the substance of the prothallus at a short distance from the concavity of its margin where the archegonia are usually found, but no trace of these latter were to be seen. At a point between the vessels and the margin, a swelling, usually on the under surface of the prothallus, soon appears, which developes into a fern-leaf: at the base of this arises a bud, which is early recognizable by its cap as a root; this grows in a direction the reverse of the leaf; after this appears another bud at the base of the leaf-stalk, and from this grows the stem. The resulting young plant is seen on section to be intimately connected with the prothallus, the structure known as the "foot" found in sexually-produced plants, being entirely absent. It is hoped that Dr. Farlow, who is now in London, will shortly have an opportunity of exhibiting his specimens, which appear to fully warrant his statement of the entire absence of archegonia in the production of the young ferns.

THE BOTANICAL CONGRESS AT FLORENCE.

The International Flower Show was opened on Monday, May 11th, by the King of Italy. Professor Parlatore being unfortunately very unwell was unable to take part in the proceedings; in his absence Prof. D'Ancona read the opening address. The exhibition is held in the new market, a stone building with a light iron roof, and divided by pillars into three sections. A fountain occupies the centre and a cascade and rockwork one end. Round the fountain is a mass of brilliant azaleas, and on either side are large beds of Palms, Cycads, Tree-Ferns, Rhododendrons, &c., with herbaceous plants. In each of the lateral divisions of the building are houses containing Orchids, Gloxinias, Marantas, Caladiums, Begonias, Fittonias, Anthuriums, &c., In one is a hybrid *Begonia*, exhibited by the Horticultural Society of Bavaria. Objects connected with Horticulture and Agriculture occupy detached rooms on either side of the market, Holland, Belgium, England, France, Sweden, Greece, Australia and Mexico are strongly represented in these sections. The greater portion of the exhibited plants naturally come from the celebrated gardens round Florence, such as those of Prince Demidoff, Counts Gheradesca and Corsi Salviati, the Torrigiani and Boboli gardens and the Botanic gardens of Florence, Pisa, Geneva, Turin, Ferrara, Padua and a few from Naples. There is a beautiful collection of the varieties of the Pansy exhibited by Prince Demidoff, and a fine bed of hardy Bamboos. Dr. Moore, of Dublin, has brought some interesting things with him, including a hybrid Sarracenia (*S. flava* × *S. Drummondii*) and *Ouvirandra fenestralis*, a novelty in Italian exhibitions.

It is, however, with the *Botanical Congress* that we have to do. This is held in the different rooms belonging to the Botanical department of the Museum of Natural History in the Via Romana. On the tables of the central Herbarium room are microscopes for dissecting, designed by Prof. Caruel, of Pisa, Karl Zeiss of Jena, Steinheil, and others. The room chosen for the general meetings and for the discussion of papers, is that in which are kept the valuable collections which were presented to the Museum by the late Mr. Webb, the unveiling of whose bust was the principal attraction of the second day's proceedings.

May 15*th*.—Soon after one o'clock, the Marquis Ridolfi, President of the R. Hort. Soc. of Tuscany, undertaking provisionally the office of president of the Congress, requested the Secretary, Prof. C. D'Ancona, to read the opening address, which Prof. Parlatore was prevented from doing through illness. After thanking all those who had accepted the invitation to the Congress, and the various Governments who had sent their representatives, he apologised for not being able to offer the vice-presidency to all the eminent men who were going to take part in it, saying, however, that the Italian members had agreed to give up their claims in favour of those of other countries.

The names of the vice-presidents were then read out, and each took his seat at the tables on either side of the president. They were as follows: Alsace, *Prof. Schimper*. Australia, *Mr. Charles Moore*. Austria and Hungary, *Prof. Fenzl*, *Dr. Maynald*, Archbishop of Calocsa, and *Prof. Tommasini*. Bavaria, *Radlkofer*. Belgium, *Senator Canart de Hamal*. Columbia, *Prof. Triana*. Denmark, *Prof. Lange*. France, *Prof. Baillon*, *Planchon*, and *Weddell*. Grand Duchy of Baden, *Prof. Seubert*. Greece, *Prof. Orphanides*. Great Britain and Ireland, *Dr. Hooker*, *Mr. Bentham*, and *Dr. David Moore*. Hamburgh, *Prof. Reichenbach, fil.* Holland, *M. Rauwenhoff* and *Prof. Suringar*. Prussia, *Prof. Carl Koch and M. Wendland*. Russia, *Prof. Bunge*, *Prof. Galeznoff*, *Prof. Regel*, *and Comm. Tchiatcheff*. Saxe-Weimar, *Prof. Strasburger*. Sweden and

Norway, *Profs. Andersson and Schubeler*. Switzerland, *Prof. Alphonse de Candolle and M. Desors*. Wurtemburg, *Prof. Hofmeister*. The Marquis Ridolfi then proposed Dr. Hooker as President for the day, who was unanimously elected. Two secretaries were then nominated —M. Stephen Sommier and Dr. Levier, and on the latter declining to undertake the post, Professor Caruel of Pisa was chosen.

The President (Dr. Hooker) having returned thanks for the honour conferred on him, announced the opening of the Congress. Sig. Ubaldino Peruzzi then, on the part of the city of Florence, and as superintendent of the Institute for Higher Studies, in a few eloquent sentences welcomed them all to the city of Florence, and reminded them of its ancient glory, and of the impulse then given to the progress of Science and Art.

The first communication was from M. Planchon on the serious ravages of the *Phylloxera vastatrix* among the French vines. This insect seems to have come from America, and M. Planchon was invited to go there for the purpose of studying the question, and to discover a remedy. He succeeded so far as to observe that some kinds of vine were attacked and not others; he hopes therefore to be able to substitute healthy plants from America in the place of those liable to disease. It remains now to adopt a mode of substitution so as not to alter the flavour and quality of the celebrated wines of France. As the disease seems to be approaching the confines of Italy, M. Planchon feels certain that the Italian vines will suffer unless urgent measures are adopted. Prof. Targioni-Tozzetti replied that measures were being taken, and that the Minister of Agriculture had prohibited altogether the importation of French vines.

Prof. Karl Koch was then called on to read a paper on the specific characters of the Bamboos which he had been studying in the Troubestkoy garden at Intra, but was unable to do so without exhibiting at the same time the specimens, which were then at the Flower Show.

M. Famintzin then read an important communication on the mode of formation of the spores of *Stemonitis fusca* and *Physarum contextum*. In the primitive plasma a certain quantity of nuclei without a membrane make their appearance, and which remain for a long time in this state; in about half-an-hour a kind of segmentation begins to take place in each of these bodies; the fissures continue to increase and to deepen till the plasmatic mass breaks up into separate portions.

Prof. Orphanides followed with a long paper on the specific characters of *Colchicum*, of which he had brought from Greece a large collection of dried specimens, by way of illustration. He believed that many of the characters given as specific were not sufficiently established.

Prof. Schimper made some interesting remarks on the discovery of a fossil vegetable impression in the granite of Mt. Blanc, which tended to favour the view of the metamorphic origin of granite.

Prof. Caruel, the secretary, after this exhibited some fine fresh specimens of *Cynomorium coccineum* from Sardinia, and explained the structure of the male and female flowers.

(*To be continued.*)

Notices of Books.

British Hepaticæ: Containing descriptions and figures of the native species of Jungermannia, Marchantia and Anthoceros. By B. Carrington, M.D., F.R.S.E. London: R. Hardwicke. Part 1.

In 1822, Dr. Greville, in a paper on some new Scottish Fungi, published in the fourth volume of the Wernerian Transactions, characterised the then recently-published "Natural Arrangement of British Plants," by S. F. Gray, as "a most extraordinary work, of great industry, but of less judgment, in which *Jungermannia* alone is split into nineteen genera." In the same year as Dr. Greville's criticism there appeared a small pamphlet by Dumortier ("Commentationes Botanicæ"), containing among other valuable papers a revision of the Hepaticæ, in which he split up *Jungermannia* into the same number of genera as Gray. Subsequent systematists have carried this work of splitting still further, and years before the death of Dr. Greville, the authors of the last revision of the European Liver-worts had increased the number of generic types included in Linnæus' genus *Jungermannia* to forty-eight. All these forms were included in the one genus in the late Sir Wm. Hooker's classic work on "British Jungermanniæ." Indeed it is only fair to say that the later systematic work of Gray and Dumortier was based on the labours of Hooker, whose figures and descriptions supplied the materials for, and his analytical key foreshadowed their generic groups. The *Hepaticæ* have been singularly neglected by British botanists. The last scientific description of the group is contained in Hooker's Cryptogamic Supplement to Smith's "English Flora," and was published more than forty years ago! The alterations proposed by Gray in our own country and by Raddi, Dumortier, Corda, and Lindenberg, were not adopted by the author, who retained the Linnean genus entire. The addition of many species to our Flora since 1833, as well as the greatly altered nomenclature of the recorded species, made it desirable to secure a new monograph of the group. It has fallen to Dr. Carrington, who has long made the *Hepaticæ* a special study, to undertake this work, and we have now the first part of his monograph in our hands. The part contains elaborate descriptions of ten species, with four octavo plates, containing some four species on each plate. The style of the book is that of Syme's "English Botany." The plates do not deserve much commendation, either for their execution or accuracy; and one cannot but feel that a good opportunity has been lost for producing not only faithful portraits of the species, but of supplying details of structural and systematic importance, which is not likely to occur again for years. The descriptive letter-press is extensive and accurate, each organ of the plant being described at considerable length. The critical observations exhibit the extensive knowledge of the author, and give promise of a valuable addition to British systematic botany. It is to be regretted that Dr. Carrington's plans have not permitted him to state in the way of preface or introduction the general principles of classification and description which he intends to follow. In a small group like the *Hepaticæ*, there should be no difficulty in having all this ready before beginning the publication, and its possession by his readers would give them a more intelligent interest in the work.

We must take exception also to the method of quoting some plant names adopted by Dr. Carrington. His first genus *Scalius* he quotes as of Gray and Bennett. But the "Natural Arrangement of British Plants," is by S. F. Gray, and there is in the work not the slightest indication that he was not the sole author. No one could ever trace *Scalius* in "Gray and Bennett's Nat. Arr. Brit. Pl.," for no such work exists. *Scalius* must always be quoted as established by S. F. Gray, even though Dr. Carrington and others have ascertained some fifty years after the publication of the name that the work was chiefly prepared by Dr. J. E. Gray, and that in the *Hepaticæ* he had the assistance of Edward Turner Bennett, who in his zoological memoirs gave high promise of an illustrious future which was too suddenly cut short by an early death.

There are also somewhat numerous misprints and wrong references in the synonymy, which indicate that greater care is requisite in the correction of the proof-sheets and verification of the authors quoted. In spite, however, of such blemishes, the book, to judge from this first part, will be a most useful one to English botanists.

W. C.

Botanical News.

ARTICLES IN JOURNALS.

American Naturalist.—(Feb.)—J. G. Cooper, "Botany of Cuyamaca Mountains."—C. C. Parry, "Botanical Observations in Western Wyoming" (contd.; and in No. for March).

APRIL.

Grevillea.—J. M. Crombie, translation of Nylander on Schwendener's hypothesis, nutrition of Lichens, &c.—M. J. Berkeley, "N. American Fungi" (contd.).—E. M. Holmes, "Bryological Notes."

Scottish Naturalist.—J. Keith, "List of Fungi in the Province of Moray" (contd.).—H. M. Drummond-Hay, "Flowering Plants of the Carse of Gowrie, Perthshire."—J. Fergusson, "Bryological Notes."

Quarterly Journ. Microsc. Science.—W. Archer, "Further resumé of recent observations on the Gonidia question."

Monthly Microsc. Journ.—R. Braithwaite, "On *Sphagnum acutifolium*, Ehrh." (tab. 57, 58).—T. Taylor, "Fungus of the Hawthorn, *Ræstelia lacerata*, Tul.; *Œcidium lacerata*, Grev."

Journ. Linnean Soc. (April 25th.)—J. D. Hooker, "On the Subalpine Vegetation of Kilima Njaro, E. Africa."—G. Dickie, "On the Marine Algæ of Barbadoes" (pl. xi., *Rhipilia Rawsoni*).—W. R. McNab, "Note on the Development of the Perigynium in *Carex pulicaris*."—W. T. Thiselton Dyer, "On the Perigynium and Seta of *Carex* (pl. 12).—J. E. Howard, "On the Genus *Cinchona*."—G.

Dickie, "Supplemental Note on Buds of *Malaxis*."—J. D. Hooker, "On *Hydnora americana*, R.Br."—G. Dickie, "On the Algæ of Mauritius."—J. Shaw, "On changes in Vegetation of S. Africa through the introduction of Merino Sheep."

American Naturalist.—D. S. Jordan, "Flora of Penikese Island." M. S. Bebb, "New Willow (*S. lævigata*) from California, and notes on other N. American species."—E. L. Greene, "Wanderings of a Botanist in Wyoming."—C. C. Parry, "Bot. Observations in W. Wyoming" (contd. 20 new species described).

Oesterr. Bot. Zeitschr.—A. Kerner, "On some Plants of the Venetian Alps."—R. de Uechtritz, "*Hieracium calophyllum*, n.s."—J. Wiesbaur, "*Galium aureum* in Hungary; *Senecio intermedius* (*viscosus* × *sylvaticus*)."—J. Val de Lievre, "Notes on *Ranunculaceæ*, &c." (contd.)—A. Kerner, "Distribution of Austrian Plants" (contd.).—E. v. Halacsy, "Localities of Austrian Plants, 1873."—H. Kemp, "Supp. to Flora of neighbourhood of Vorarlberg" (contd.).

Bot. Zeitung.—F. Kienitz-Gerloff, "On Development of Spermogonia of Hepaticæ" (contd.).—H. Hoffmann, "On *Papaver Rhœas*."

Flora.—L. Celakovsky, "On the Morphological Significance of Seed-buds" (contd.).—F. Arnold, "Lichenological Fragments, xvi." (contd.)—J. Muller, "Notes on Nomenclature."—Id., "Lichenological Contributions."

Hedwigia.—G. V. Niessl, "Correction of Rabenhorst's Fungi Europ., cent. 18."—G. Winter, "Mycological Notes" (with plate) (*Delitschia Winteri*, Plowright. King's Lynn, Norfolk).

Botaniska Notiser.—F. W. C. Areschoug, "On the Anatomy of Leaves" (contd.).—J. M. Norman, "Notes on Plant-Chemistry."—A. Grunow, "*Sphacelaria Clevei*, n.s."—J. A. Leffler, "On a new Scandinavian species of *Rosa*."

New Books.—C. C. Babington, "Manual of British Botany" ed. 7 (Van Voorst 10s. 6d., thin paper, 12s.).—J. C. Mansel-Pleydell, "Flora of Dorsetshire" (Whittaker & Co., 10s.).—A. Blytt, "Norges Flora" (Flora of Norway) vol. ii., pt. 1. Coniferæ—Compositæ (Christiania.).—B. Carrington, "British Hepaticæ, Descriptions and Figures," part 1 (Hardwicke, 2s. 6d. plain, 3s. 6d. coloured).—T. C. Porter and J. M. Coulter, "Synopsis of the Flora of Colorado' (Washington.).—L. Kny, "Botanische Wandtafeln," part 1 (10 diagrams, with descriptive text, Berlin, 24s.)—D. Oliver, "Illustrations of the Nat. Orders of the Veg. Kingdom" (Longmans, 16s. plain, 26s. coloured.).

A new edition in French and Latin of Schousboe's work on the plants of Morocco, printed in Danish at the beginning of the century, has been published at Lyons.

The "Gardeners' Chronicle" of May 2, contains a paper by Prof. Thiselton-Dyer on the Tree Aloes of S. Africa. Besides the long known *A. dichotoma* of Namaqua-land, the author describes *A. Bainesii*, n.s., from the northern part of Natal, and *A. Barberæ*, n.s., from Caffraria.

In the "Revue Horticole" for March and April is given an enumeration by E. Morren of the genus *Trichopilia*; 17 species are included. There is also a suggestive paper by E. Roze on the systematic culture of Parasitic Fungi in Botanical Gardens.

In the Bericht of the Senckenberg Natural History Society for 1872 are papers on the botany of the Canary Islands by Drs. Noll and Grenacher, on two abnormal fruits of *Cactus* by Dr. Noll (with 2 plates), and on general plant-geography by J. D. Wetterhan.

"Revue Bryologique" is the title of a new quarterly journal devoted to Muscology. It is a modest little periodical, consisting of 16 pages, and the subscription for France 4fr., for other countries 4fr. 50c. The first number contains short papers by the bryologists MM. Roze, L. Piré, Gravet, Renauld, and T. Husnot the editor, to whom (at Cahan, par Athis, Orne, France) all communications should be addressed.

The old-established horticultural periodical, the "Floral Magazine," has quite recently passed into the hands of Mr. W. G. Smith as editor, who has for some time drawn the plates. Under the new management we may expect to see the botanical side of horticulture somewhat more developed. Four plates of quarto size are given with each number, boldly, if somewhat roughly, drawn by the editor; we prefer the excellent woodcuts in the April and May numbers to these over-coloured drawings. It is a subject for regret that the figures in all modern horticultural magazines should be almost invariably spoilt by gaudy and unnatural painting; so good a colourist as Mr. Smith might well initiate a reform.

Mr. Van Voorst has commenced a re-issue, the third, of Sowerby's and Johnson's "British Wild Flowers." Each monthly part, price 3s., contains 4 fully coloured plates, and each plate a fragment sufficient for identification of 20 species taken from the original figures of English Botany, with descriptions. There will be 22 monthly parts. As an illustrated key or index to the British flora this book has proved very useful. We also observe that Messrs. Warne have commenced a third issue of Miss Pratt's "Flowering Plants and Ferns of Great Britain," the most trustworthy, as far as it goes, of the popular books on the subject.

Prof. Bentley delivered a lecture at the Royal Botanic Gardens, Regent's Park, on March 14th, upon the character, properties, and uses of *Eucalyptus globulus*, and other species of the genus. This has been since printed, and contains a succinct account of what is known of the subject.

Karl Friedrich Meisner, or, as he recently spelt his name, Meissner, Professor of Botany at Basle, died on May 2nd, after a long illness. He was born at Berne, November 1, 1800. His monograph of *Polygonum* appeared in 1826, and for forty years from that date various papers and works on *Polygonaceæ*, *Laurineæ* and other apetalous plants have been published by him. The monographs of these two natural orders in De Candolle's "Prodromus," as well as those of *Proteaceæ*, *Thymeleæ*, and *Hernandiaceæ* were written by Meissner, and he is also the author of several monographs in the "Flora Brasiliensis" and of a very comprehensive and useful work which must have been the result of an immense amount of labour, with the title of "Plantarum Vascularium Genera," which was printed in 1836-43. The late Professor attended the Botanical Congress in

London in 1866, since which year he has been more or less an invalid, and has not, we believe, recently undertaken the duties of his chair. He was a foreign member of the Linneau Society of London.

Claude Gay, the well-known historian and botanist of Chili, has recently died in his seventy-fourth year. He was the author of an extensive work on the history and biology of Chili, and of numerous papers bearing on the same subject. He was a member of the French Institute

The death of Dr. G. A. Herrich-Schaeffer occurred on April 14th, in the seventy-fifth year of his age. He was director of the Bavarian Botanical Society, and editor of the Regensberg periodical "Flora," from 1861 to 1871.

With deep concern we read that there is every reason to believe that the Rev. R. T. Lowe perished in the wreck of the "Liberia" on his way to Madeira. As is known to most of our readers, this accomplished botanist, and good and amiable man, had been long engaged on a Flora of Madeira, of which one volume and two parts of a second have been published. Waiting more definite news, we postpone any further details of Mr. Lowe's life and works.

Messrs. Porta and Rigo have set off on a botanical expedition this summer into the Abruzzi. They will visit the Gran Sasso peak, and, it is expected, will be absent till the middle of August. The subscription price to the sets collected is 6⅔ thl (£1) per century. Further particulars may be known from Rupert Huter, Sexten, Tyrol.

M. le Comte Jaubert has secured from the French National Assembly the restoration at the Muséum d'Histoire Naturelle of Jussieu's Chair of Botany, which was suppressed in 1853, after the death of Adrien de Jussieu, and, by a decree dated January 23 of this year, M. Bureau has been named Professor. M. Bureau's post of aide-naturaliste in the Museum thus vacated has been filled by M. Max Cornu.

The fourth Report of the Royal Commission on Scientific Instruction and the Advancement of Science was issued some time back, and the more important recommendations have been commented on and criticised by the public press. Much interesting matter will be found in its pages relating to the two botanical establishments at Kew and the British Museum, the large amount of evidence before them having enabled the Commissioners to give much information in a few words. With regard to some of their recommendations, we venture to think that they would not have been made had there been a single botanist on the Commission. Some one was wanted with a practical knowledge of the present state of both herbaria and the wants of the scientific and general public. The outcome of the investigation seems likely to be that both establishments will pursue their course in their own way as hitherto.

The anniversary meeting of the Linnean Society was held on Monday, May 25, when Dr. Allman was elected President in the room of Mr. Bentham, and Mr. St. George Mivart, zoological secretary, instead of Mr. Stainton. Contrary to custom there was no address from the chair, but a satisfactory balance-sheet was laid before the Fellows, and there was a good deal of conversation on various matters connected with the future conduct of the society.

Original Articles.

NOTE ON THE INDIAN SPECIES OF *CRATÆVA*.

By S. Kurz.

(Tab. 147, 148.)

In the present paper I wish to take up the question: Is there but one species of *Cratæva* in India, or are there more?

R. Brown, in the Appendix to Oudney, Denham, and Clapperton's "Narrative of Travels in N. and C. Africa," recognises more than one species, and points out also the difficulty of technically separating *Cratæva* from *Capparis*, otherwise than by the open æstivation of the corolla. Hamilton in the "Linnean Transactions," vol. xv., also indicates that at least 4 species occur in the Gangetic provinces, an opinion with which I fully coincide, although only 3 of his species appear to me to be admissible. Hooker and Thomson in the "Flora of British India," however, reduce them all, and adopt only a single species, which they identify with the Australasian *C. religiosa* of Forster.

Miquel, in his "Illustration de la Flore de l'Archipel Indien," figures *C. tumulorum*, Miq., a species well separated by the oval-reniform tubercled seeds and long slender petiolules. The two other species mentioned there must remain for the present doubtful. Forster's *C. religiosa* is unknown to me, and I am reluctant to follow the prevailing opinion amongst botanists in the identity of it with *C. Roxburghii*, the more so as the latter is a xeroclimatic tree, whose geographical distribution excludes the possibility of its reappearing in the Society Islands. Loureiro's two species remain still more obscure to me.

In the Journal of the Asiatic Society of Bengal, 1872, I described a very distinct species, *C. hygrophila*, which, unlike the other Indian Species, grows in the shade of the swamp forests of Pegu. Up to that date I followed the views of former botanists, believing in the great variability of the species. An accidental examination of the seeds, however, has taught me the danger of superficial examination, and a glance at the accompanying plates will leave no doubt that R. Brown, and more especially Hamilton, had good reasons for their views.

Hooker and Thomson give as the only habitats for their aggregate species, *C. religiosa*, Malabar and Concan, and state that it is cultivated elsewhere in India. They give the distribution as Tropical Africa. My own and Hamilton's investigations, however, tend to contradict their statements, and Oliver's identification of the African *C. religiosa* (Fl. Trop. Afr., i., 99), requires confirmation.

The foliage of all the species of *Cratæva* is very variable on the same tree and at different stages of development, and long acuminate and bluntish leaves of broader or narrower shape may be observed on the same branch. The length of the petioles and petiolules is more constant, if we bring into account variation of the same within certain limits of the species itself. The ovary appears to be constant in shape, and in flowering specimens offers some guidance. The fruits again appear to me to be tolerably marked in shape, although rather variable in size. The number and nature of the placentas require further inquiry, but at all events there are either truly or spuriously 2-celled fruits in *C. lophosperma* and *C. Nurvala*. Of this Hamilton seemed to be aware, for he calls one of his species *C. unilocularis*. Of the floral parts only the sepals seem to furnish any characters, although the petals also in the well developed hermaphrodite flowers show differences in size and shape in several species. However, I will not enter here fully into a discussion about these relations, as I have not flowers and fruits from the same trees in the necessary completeness and quantity, and it is often irksome to match correctly the different stages of development from deciduous trees, especially if the external resemblance is so great as in the case of *Cratæva*.

The following is a short revision of the species of *Cratæva* as far as known to me. I find myself under the necessity of creating two new species, of which *C. macrocarpa* may have to be identified with one or other of the Malayan species when better known. I regret to say that the material at my disposal is not rich enough for clearing up the synonymy and other doubtful points, but I hope I have succeeded in demonstrating that there are really more than one single Indian species of *Cratæva*.

Conspectus of Species.

* Ovary globular or ovoid-globular. Berry globular.
  † Seeds crested or tubercled.
    Berry 2-celled; seeds ½ in. long, compressed, tubercled-spinulose on back.—*C. lophosperma.*
    Berry 1-celled; seeds reniform-oblong, c. 2 lin. long, sparingly tubercled.—*C. tumulorum.*
  †† Seeds smooth. Berry 1-celled.
    Sepals petaloid, from ovate to lanceolate; petals 1-1½ in. long; seeds helicoid-reniform 2½-3 lin. long., blackish.—*C. Roxburghii.*
    Sepals linear, subulate-acuminate; petals ½ in. long; seeds trigonous or angular-reniform, 4-5 lin. long.—*C. unilocularis.*

** Ovary oblong or cylindrical.
  † Seeds ½ in. long, smooth?.
    Berry elliptical, 2½-3 in. long, along with the stalk densely set with pale lenticels.—*C. macrocarpa.*
  †† Seeds 1½-2 lin. long.
    Berry ovoid or oblong, 2-celled?; seeds angular and flat; large tree.—*C. Nurvala.*
    Berry spindle-shaped oblong, 1-celled; seeds reniform, smooth; small shrub.—*C. hygrophila.*

1. C. LOPHOSPERMA, *nov. sp.* A small tree, all parts glabrous; leaves 3-foliolate, glabrous, petiole 1-1½ in. long; adult leaflets ovate-lanceolate, the lateral ones obliquely so, unequal and oblique at base; petiolule ·1-2 lin. long, long-acuminate, chartaceous, glaucescent beneath, the lateral nerves rather prominent; flowers unknown; berry globular, 2-celled, the size of a wild apple, roughish, whitish; seeds reniform, somewhat compressed and perforate in centre, c. 4 lin. broad and long, the sides almost smooth, the back tubercled-spinulose.

Hab.—Banks of the Koolsee river, Kamroop, Assam. (*Gustav Mann.*) Fr. July. (Tab. 147, fig. 4—6.)

2. C. TUMULORUM, *Miq.* Ill. fl. Arch. Ind., i., 21., t. xi.—(*C. Tapia*, Bl. Bijdr., 54 et Miq. Fl. Ind. Bat., i., 2, 102, non alior.)

Hab.—Java.

3. C. ROXBURGHII, *R. Br.*, in Denh. & Clapper. Afric. Trav. Append., 224. Hook. Ic. Pl., t. 178.—(*Capparis trifoliata*, Roxb. Fl. Ind. ii., 571; *C. odora* and *C. religiosa*, Ham. in Linn. Trans. xv., 122 and 119.)

Hab.—Not unfrequent in the drier parts of Hindostan and N. W. India, as in Ceylon ?, Thilum, Kamroop, Saugor, Coimbatore, &c.; also in the Prome District of Pegu. Fl. hot season. (Tab. 148, fig. 1—5.)

4. C. UNILOCULARIS, *Ham.*, in Linn. Trans. xv., 121.—Berries globular, an inch thick, smooth, sprinkled with whitish dots; seeds trigonously or angular-reniform, c. 4-5 lin. long, smooth, blackish.

Hab.—Terai of the Himalayas, Kamroop (Ham.); Sikkim Terai, in dry and sal-forests not uncommon. Fl. hot season; Fr. close of rains. Grows on gravelly substrata chiefly. (Tab. 147, fig. 1—3.)

5. C. MACROCARPA, *nov. sp.* Tree ?, all parts glabrous; leaves 3-foliolate, petiole 2 to 4 in., long, slender glabrous; young leaflets ovate-lanceolate, the lateral ones unequally so, very shortly petioluled or almost sessile, 3-4 in. long, cuneate-acuminate at base, usually bluntish acuminate, membranous; flowers (hermaphr.) large, pedicels 1-1½ in. long, glabrous, arising solitary from the axils of the young leaves; petals oval, blunt; the blade 1 in. long, the claw about ½ in. long; filaments 2¼-2½ in. long, not more than 15, berry 2½-3 in. long, elliptical, on a lenticellate-rough stalk of similar length, pale coloured and roughish from numerous whitish lenticels, 1-celled; seeds about ½ in. long, (unripe and much collapsed, but apparently reniform-compressed, with rounded back, or angular-reniform, smooth.)

Hab.—Malaya (Maingay, No. 125).

The species requires comparison with *C. membranifolia*, Miq., on the one side, and with *C. Nurvala* of this Dutch botanist on the other. (Tab. 148, fig. 8—10.)

6. C. NURVALA, *Ham.*, in Linn. Trans., xv., 121.—*C. Nurvala*, Rheed. Hort. Malab., iii., t. 42; *C. Tapia*, Vhl. Symb. iii., 61 ?).—Berry according to Rheede oblong or roundish oblong, "the flesh 4-parted"; seeds yellowish, very hard, angular and flat. Sepals narrower and smaller than in *C. Roxburghii;* ovary always oblong.

Hab.—All along the western coasts of Hindustan.

A species with oblong ovary but broader leaves, of which the unripe fruit is 2-celled, occurs in the Khasya hills, Assam, Silhet, and

Upper Tenasserim. This is no doubt the tree to which allusion is made by Hamilton, l.c., 122. I have little doubt it is the true *C. Nurvala.*

7. C. HYGROPHILA, *Kurz,* in Journ. As. Soc. Beng., 1872, 292.—Seeds compressed reniform, c. 2 lin. long, smooth and glossy.

Hab.—Not uncommon in the swampy forests of the Irrawaddi Alluvium of Pegu.—Fr. cold season. (Tab. 148, fig. 6, 7.)

Incompletely known species.

C. membranifolia, Miq. Suppl. Fl. Sumatr., 387.—W. Sumatra.

C. religiosa, Bl. Bijdr., 59; non Forst.; Miq. Ill. Fl. Arch. Ind., i., 20.—(*C. Magna,* Hassk. Cat. Bog.; Miq. Fl. Ind. Bat., i., 102, et Suppl. Fl. Sumatr., 387.)—Java and W. Sumatra.

C. religiosa, Forst. Prod. i., 203.—Society Islands.

C. magna, DC. Prod., i., 243.—(*Capparis magna,* Lour. Fl. Coch., i., 404).—Cochin China.

C. falcata, Dr. Prod., i., 243.—(*Capparis falcata,* Lour. Fl. Coch., i., 405).—China, Canton.

DESCRIPTION OF TAB. 147 & 148.

Tab. 147.—Fig. 1, *Cratæva unilocularis,* Ham; 2, Fruit; and 3, seeds; all nat. size. 4. fruit, and 5, seed of *C. lophosperma,* Kurz, nat. size; 6, seed somewhat enlarged.

Tab. 148.—Fig. 1, Fruit of *C. Roxburghii,* R. Br.; 2, same cut transversely; 3 and 4, seeds; all nat. size; 5, seed, magnified (1-3 copied from Roxburgh's drawings); 6, berry; and 7, seed of *C. hygrophila,* Kurz, nat. size. 8, berry, and 9 and 10 unripe, and collapsed seeds of *C. macrocarpa,* Kurz, nat. size.

DESCRIPTION OF A NEW SIKKIM VINE.

By S. KURZ.

VITIS SPECTABILIS, *Kurz.*—Frutex alte scandens, ferrugineo-hirsutus; folia lato-cordata, obsolete 3-5-lobato, basi sinuato-cordata, obtusa, denticulata, ½-¾ ped. lata, petiolo crasso 2-3 lin. longo suffulta v. subsessilia, crasse membranacea, ferrugineo-hirsuta, supra scabrescentia; flores minimi, pedicello gracili 1-3 lin. longo suffulti, cymas pedunculatas trichotomas oppositifolias parce ferrugineo-hirsutas efficientes; pedunculus ½-1½ poll. longus; calyx truncatus, ½ lin. vix longus; petala lineam circiter longa, canescenti-puberula; stylus c. ½ lin. longus, truncatus; baccæ valde immaturæ obovatæ.

HAB.—In the damp hill forests about Khersiong, at 5000-6000ft. elevation. Sikkim, Himalaya.—Fl. Jul. Sept.

Habit and affinity of *V. Linnæi,* but widely differing by the indumentum, almost sessile leaves, etc.

CONTRIBUTIONS TO ORCHIDOLOGY.

By H. G. REICHENBACH, FIL.

I. *New Orchids discovered by the Rev. C. Parish, at Moulmein.*

A full enumeration of the Orchids of Moulmein, Burmah, has just appeared in the "Transactions" of the Linnean Society of London, which kindly undertook its publication. I now give descriptions of the new species discovered in 1873.

HEMIPILIA CALOPHYLLA, *Par. & Rchb. f.;* folio tenui cuneato oblongo seu rotundo acuto brunneo marmorato, pedunculo tenui univaginato apice racemoso plurifloro, bracteis triangulis ovatis ovaria pedicellata longe non æquantibus, sepalis triangulis, sepalo summo quidem minus attenuato, sepalis triangulis minus acutis, labello oblongo seu obovato antice retusiusculo emarginato undulato, calcari conico ovario pedicellato duplo breviore, processu rostellari uncinato ascendente, cruribus stigmaticis minutis inclusis.

The leaf is dark green, very beautifully mottled and netted with brown, and equals that of the common *Hemipilia cordifolia*, Lindl., as does the whole plant. The elegant flowers are white with green tips to the sepals and petals, the lip is purplish, and, according to a note of the Rev. C. Parish, flowers wholly purplish occur. The striking features of the plant are found in its cuneate leaf (though I have a single specimen from the Himalayas of *H. cordifolia* with such a leaf, whilst all the other specimens are duly cordate), and in the very distinct conical spur. I know nothing of the colour of the leaves in the common *H. cordifolia.* The column is acute at its apex, and the sides of the stigmatic hollow are retuse and emarginate. The rostellar process is produced like a beak, and the caudicles furnished with a very strongly marked angle.

For my first knowledge of this plant I have to thank Dr. Hooker and Prof. Oliver, who showed me a rough sketch, and either one or two separate flowers which had been sent from Burmah, by Mr. Gilbert. It was quite impossible to form any opinion on such materials *d'après le dernier goût.* More lately I have had the satisfaction of getting a beautiful specimen (8-flowered), and a very skilful drawing with dissections, by the kindness of our keen botanist, the Rev. C. Parish, who observed the plant on limestone rocks near Moulmein in August, 1873. It was a great pleasure to obtain such satisfactory material at a time when human idleness, to judge from scanty specimens, appears to proceed as though paper bore the price of diamonds, a bottle with a few drops of alcohol exceeded the means of a private individual, and drying a few specimens were beyond the powers of nature.

SACCOLABIUM FRAGRANS, *Par. & Rchb. f.;* valde humile, foliis brevissimis ligulatis apice subacutis obliquis inæqualibus, siccis rugosissimis, racemis decurvis plurifloris pluribus, bracteis triangulis ovaria pedicellata infima dimidio æquantibus, sepalis petalisque ligulatis obtuse acutiusculis, labello elongato trifido, laciniis lateralibus semiquadratis hinc repandulis, obtusangulis, lacinia media cuneata apice rhombea acuta medio callosa, callo parvo inter lacinias laterales, calcari angulato apice inflato obtuso ovarium pedicellatum plus dimidio æquante, columnæ basi utrinque angulata.

Our plant is a small thing; no wonder it was overlooked. The roots are flexuose, furrowed and very large for such a dwarf, scarcely half an inch high. The leaves reach the length of one inch; there appear to have been seven on the specimen (four fallen off); five are represented in the Rev. C. Parish's nice sketch. They are entirely covered with flexuose transverse wrinkles, which look very. pretty under a lens. The inflorescences are bent down and bear as many as fifteen flowers, as minute as those of *S. pusillum*. The sketch shows the stalked ovary green with the middle part whitish-rosy; the sepals green at the base, the rest purplish like the whole petals and lip; spur light whitish-rose. The smell is like that of violets according to the discoverer, who collected it May 14, 1873. We may compare it with the following species: *S. brevifolium*, Lindl., is a tall, caulescent plant, and differs widely in its flowers, especially in the spur. *S. pusillum* (*Œceoclades pusilla*, Lindl.) has a much longer and very acute spur, and *S. gracile*, Lindl., has the spur much longer and straight. These are the only species which need comparison.

BULBOPHYLLUM (*Cirrhopetalum* § sepala et petala limbo calva) TÆNIOPHYLLUM, *Par. & Rchb. f.*; pseudobulbo conico apicem versus bene angustato, sicco longitudinaliter favoso rugoso et transverse ruguloso, folio cuneato ligulato obtuso acuto pedunculum umbelliferum superante, bracteis latiuscule triangulis uninerviis, ovaria pedicellata longe non æquantibus, sepalo dorsali abbreviato triangulo 5-nervi, sepalis lateralibus ter quater longioribus basi liberis dein connatis (conglutinatis ?) acutis utroque sepalo trinervi, petalis ligulatis acutis trinerviis, columna breviter biseta longioribus, labello ancipiti semilunato.

A sketch by Mr. Parish shows the flowers a pallid yellowish-green with copious purplish dots. The plant was found at Moulmein, May 30, 1873.

This Orchid made me think at once of *Cirrhopetalum Macraei*, Wight (non Lindl.). Dr. Thwaites, the eminent Cinghalese botanist, and myself discovered, independently of one another, that Dr. Wight's *C. Walkerianum*, Lindl., was really *C. Macraei*, Lindl., and his *C. Macraei* was a new species. (See Thwaites Ceyl., p. 299 anno 1861, and Rchb. f. in Walp. Ann., vi. 263, 1860 or 1859.) We do not, however, fully agree, though nearly so, as to the second one. Dr. Thwaites makes a *C. Wightii*, Thw., quoting Wight Ic., 1652, (*C. Macraei*, Wight), and C.P., nos. 3160, 2740, and says distinctly, "very variable in size, and in the colour of the flowers, or possibly further observation may show that I have confounded two distinct, though closely allied, species." I have named Dr. Wight's plant *Bulbophyllum Elliæ* (Walp. Ann., l.c.), and, this will be an earlier name than Dr. Thwaites's, so far as concerns C. P., no. 3160. As, however, I am so fortunate as to possess types of both the C. P. numbers, I must confess that I regard the two as not closely allied but widely distinct. No. 3160 having been treated with a hot iron its investigation is disgusting, which accounts for the lynx-eyed Dr. Thwaites not having looked more closely at it. The other, no. 2740, differs at first sight by the dark purplish apices of the upper sepals and petals. Both species are much smaller than our new Parishian plant, which nearly equals in size true *B. Macraei*.

It will, I think, be well to describe here these two Cinghalese species.

BULBOPHYLLUM (*Cirrhopetalum* § sepala et petala limbo calva) ELLIÆ, Rchb. f., Walp. Ann. vi., 263; rhizomate repente valido, pseudobulbis distantibus conicis jugosis, foliis a petiolari basi sensim onge cuneatis ligulatis apice bilobis, pedunculi subæqualis vagina caulina arcta, umbella pluriflora, bracteis triangulis angustis ovaria pedicellata non æquantibus, sepalo summo oblongo obtuso apice cucullato inflexo 5-nervi, sepalis lateralibus multo longioribus basi tantum liberis, ceterum unitis ligulatis acutis 5-nerviis, labello sigmoideo ancipiti columna apice tridentata, dentibus lateralibus bidenticulatis.—C. P., 3160. Wight, l.c. Thwaites, l.c. e.p.

B. (*Cirrhopetalum* § sepala et petala limbo calva denticulata) Thwaitesii, *n.s.*; rhizomate teneriore, pseudobulbis magis approximatis conicis longitudinaliter et transverse rugosis, foliis a basi petiolari abrupte dilatatis oblongis bilobis pedunculis paulo brevioribus, vagina una caulina cucullata, bracteis triangulis latis brevibus, sepalo dorsali triangulo trinervi, apice eroso denticulato, sepalis lateralibus basi fissis demum connatis multo longioribus, petalis obtuse semi-ovatis acutis apice denticulatis, labello sigmoideo ancipiti, columna utrinque acute unidentata. C. P., 2240. Thwaites, l.c. e.p.

ON TWO NEW SPECIES OF PELLÆA FROM NAMAQUALAND.

By J. G. Baker, F.L.S.

The two following new species of *Pellæa* were discovered by His Excellency Sir Henry Barkly in Namaqualand, upon the same excursion as that in which *Melianthus Trimenianus* was found; and as they are just too late for the new edition of the "Synopsis Filicum," I give descriptions of them here.

1. **Pellæa lancifolia**, *Baker*.—Stem densely tufted, castaneous like the rachis, 2-3 inches long, with only a few minute linear scales at the very base; fronds lanceolate bipinnatifid or bipinnate, 4-5 inches long, 12-15 lines broad at the middle, narrowed to both ends; pinnæ 10-12-jugate, patent, subsessile, the upper simple, the central ones the largest and most developed, ⅜-½ inch broad, lanceolate-deltoid, cut down to a flattened rachis into 2-3 pairs of oblong-deltoid pinnules, which are either adnate by their whole base or nearly so; texture membranous; both sides bright green and quite naked, as is also the fragile castaneous rachis; involucre continuous greenish half a line broad, crenated both on the inner margin and edge of the frond.

Closely allied to *P. profusa*, J. Smith, from the same country, from which it differs by its less-divided lamina, naked stipes and rachis, and remarkably broad involucre.

2. **Pellæa namaquensis**, *Baker*.—Stems densely tufted castaneous, 2-3 inches long, clothed throughout with distant spreading minute linear scales; rachis castaneous, with a few minute scales of the same kind; fronds lanceolate-deltoid, 2-3 inches long, tripinnatifid, the 6-8 jugate pinnæ growing gradually smaller and less compound from the lowest to the highest, the former distinctly stalked, erecto-patent deltoid bipinnate ¼-½ inch broad, subequal at the base, the lowest pinnules lobed or even cut down to the rachis into a few close entire blunt segments; texture firm, membranous; both sides bright green and naked; involucre continuous similar to that of the other

species, but not more than half as broad. About midway between *P. profusa* and *consobrina* in cutting and general aspect.

EUPHORBIACEÆ NOVÆ

A CL. DR. LORENTZ IN REPUBLICA ARGENTINENSI LECTÆ
ET A CL. PROF. DR. EICHLER COMMUNICATÆ,
auctore J. MULLER, ARG., CUST. HB. DC.

1. **CROTON ARGENTINUS**, *Müll. Arg.*, petiolis limbo multoties brevioribus, limbo angusto obscure penninervio basi eglanduloso utraque facie cum ramis et floribus lepidibus argenteis profunde radiantibus vestito, stipulis exiguis glanduliformibus, racemis oliganthis bisexualibus v. masculis, bracteis lanceolato-linearibus 1-floris flores superantibus, calycis fem. laciniis late lanceolatis capsulam subæquantibus, petalis florum masc. obovato-lanceolatis undique densius villoso-tomentosis, staminibus 16, filamentis inferne longo tractu villosis, antheris dimidio longioribus quam latis, ovario tomentoso, stylis bis bifidis, capsulis majusculis, seminibus lævibus.

Fruticulus 1-3-pedalis, ramosissimus. Caules florigeri sæpius pedales, rami duplo et ultra breviores, a basi densiuscule foliosi, is axillis foliorum fere undique ramulum perexiguum valde microphyllinum valdeque abbreviatum gerentes, tota longitudine lepidibus fulvescenti-argenteis densis tecti; internodia foliis 2—3-plo breviora. Stipulæ perexiguæ, subinde plane indistinctæ. Petioli 2-2½ mm. longi. Limbus foliorum caulinorum 2½-3½ cm. longus, 4-5 mm. latus, ramulinorum circ. quarta parte v. triente brevior, lanceolatus, obtusiusculus, basi obtusus, supra virens, subtus cinereo-argenteus, margine integer, satis mollis. Lepides paginæ superioris pro ⅓ longitudinis 12-16-radiantes, paginæ inferioris pro ⅔ longitudinis 24-32-radiantes et densiores quam in pagina superiore, omnes centro disculum nitidum subplanum ostendentes. Racemi foliis subduplo breviores, sæpe omnino masculi, hinc inde autem basi florem fem. subsessilem gerentes. Rhachis angulata, tenuis. Bracteæ 5 mm. longæ, integræ, bracteolis evolutis destitutæ. Calyx fructiger 6 mm. longus, extus albido-subtomentosus, intus pubescens, laciniæ infra medium glabræ et pallide fuscæ. Calyces masc. aperientes 2½ mm. lati, latiores quam longi, depresso-obtusi. Glandulæ hypogynæ brevissimæ, late truncatæ, glabræ. Filamenta validiuscula. Antheræ ⅔ mm. longæ. Capsulæ nondum omnino maturæ 6 mm. longæ, breviter subargenteo-tomentellæ.—Juxta *C. leptophyllum* locandus est, a quo differt foliis utraque pagina lepidotis, racemis bisexualibus, colore cinereo-argenteo indumenti et fructibus et floribus multo majoribus.

Habitat in collibus saxosis Las Peñas in Reipubl. Argentinæ prov. Cordoba: Lorentz n. 288, *et ibidem in silvis montanis in Cerro de San Roque: Lorentz, n.* 426., *in hb. Eichl. et in hb. DC.*

β. CHLOROPETALUS, *Müll. Arg.*, foliis 2-3-plo minoribus, floribus minoribus et longius pedicellatis, petalis magis virescentibus.

Varietas leviter monstruosa. Folia 5-10 mm. longa. Pedicelli florum masc. calycem sesqui v. bis æquantes, nec ut in forma genuina calyci circ. æquilongi.

Habitat cum forma genuina: Lorentz, n. 288.

2. **Croton sarcopetalus**, *Müll. Arg.*, petiolis limbo 3-5-plo brevioribus, limbo breviter quintuplinervio cæterum penninerivo basi subtus sessili-biglanduloso utraque pagina pilis subadpresso-stellatis mollibus in pagina inferiore subarachnoideo-mollibus vestito, stipulis parvis subulatis integris, racemis spiciformibus elongatis floribundis, floribus fem. numerosis longo tractu subdense dispositis masculis parvis, bracteis lineari-lanceolatis integris masculis 1-3-floris, calycis fem. laciniis anguste lanceolatis acutis, petalis florum masc. lanceolato-spathulatis margine puberulis basi utrinque villosis cæterum undique glabris florum fem. nanis glanduloso-carnosis subsessilibus olivaceis dilatato-ovatis cochleariformi- v. galeato-incurvis glandulas hypogynas simulantibus, staminibus 16-21, filamentis glabris v. ima basi puberulis, antheris dimidio longioribus quam latis, ovario hirsuto, stylis semel bipartitis, capsulis subglobosis, seminibus oblique costatis et rugoso-asperis.

Frutex altitudine humana elatior. Ramuli, petioli, pagina inferior foliorum et inflorescentiæ pilis stellatis longirameis mollibus subintricatis v. implexis, nunc pallide fulvis nunc cinerascenti-albidis vestiti sunt, illi teretes, superne sub indumento sulcato-angulosi. Stipulæ 1½ mm. longæ, subulatæ, rigidulæ, suboccultæ. Petioli 2-3 cm. longi. Limbus foliorum 7-11 cm. longus, 4-5½ cm. latus, ovatus, longius cuspidato-acuminatus, basi rotundato-obtusus, margine subappendiculato-denticulatus, supra pubescens, subviridis, subtus albido-subtomentosus, submembranaceus; costæ basilares dimidio limbo multo breviores, secundariæ utrinque 6-8, distantes. Racemi 6-9 cm: longi. Bracteæ 3-4 mm. longæ, tomentosæ. Flores fem. sessiles, masculi pedicellis iis æquilongis demum præditi. Calyx fem. 3 mm. longus, sub fructu haud accrescens, masculus aperiens 2 mm. latus, depresso-globosus, obtusissimus. Petala florum fem. cum laciniis calycinis alternantia valde peculiaria, calyce multoties breviora. Disci hypogyni pentagoni lobi abbreviati, late truncati. Capsulæ 4½ mm. longæ. Semina 3½—4 mm. longa, utraque facie oblique undulato-costata, fuscescenti-plumbea, nitida.—Nulli nisi *C. Soratensi* in Bolivia crescenti proxime affinis est, a quo primo intuitu foliis magis membranaceis, cuspidato-acuminatis, indumento longiore et debiliore, dispositione florum femineorum, floribus masc. minoribus et nihilominus magis polyandris, et dein forma valde peculiari petalorum fem. differt.

Habitat in silvis montanis umbrosis prope Ascochinga in Republ. Argentinensi: Lorentz, n. 293, *in hb. Eichl. et in hb. DC.*

3. **Croton Lorentzii**, *Müll. Arg.*, petiolis limbo 4-5-plo brevioribus incrassatis, limbo basi breviter trinervio cæterum penninervio basi subtus biglanduloso, stipulis obsoletis, racemis demum longiusculis sublaxifloris, rhachi tereti, bracteis lanceolatis masculis 3-floris, calycis fem. laciniis ovatis acutis, petalis florum masc. lanceolato-spathulatis glabris in ungue dense lanatis, staminibus circ. 15, filamentis inferne lanatis, antheris duplo longioribus quam latis, ovario tomentoso, stylis rigidis in crura duo gracilia divisis, capsulis majusculis calycem fructigerum pluries excedentibus, seminibus lævibus.

Fruticulus altitudinem humanam semiæquans, erectus, dense ramosus. Ramuli ultimi et penultimi teretes, hi diametro 2¼-2¾ mm. æquantes et glabrescentes v. glabrati, pallide fuscescentes, illi tomento stellari satis adpresso denso ex albido-flavicante et fusco v. ferrugineo variegato v. subferrugineo quasi incrassati; internodia foliis 3-4-plo breviora. Stipulæ sub indumento desunt. Petioli more ramulorum indumento denso incrassati sunt. Limbus foliorum 2-2½ cm. longus, 8-15 mm. latus, oblongo-ellipticus v. oblongato-ovatus, superiorum apice acutus, inferiorum obtusus, omnium basi obtusus, margine tenuissime et creberrime glanduloso-exasperatus, utraque pagina sed subtus densius pilis stellatis fere horizontaliter radiantibus breviusculis dense vestitus; costæ secundariæ utrinque 3-4, parum conspicuæ sed distinctæ; glandulæ paginæ inferioris flavicantes, arcte adpressæ, demum fuscescentes et margine pallidiore obtuso et leviter prominente cinctæ. Racemorum spiciformium rhachis more foliorum et florum vestita subferrugineo-argillacea. Bracteæ 2-2½ mm. longæ, subintegræ. Flores fem. cujusvis racemi circ. 3-6, laxe approximati. Pedicelli fem. 1 mm. longi v. juniores indistincti, incrassati. Calyx fem. 3. mm. longus, sub fructu non accrescens, capsulæ adpressus, masculus aperiens depresso-globosus, 2½ mm. latus, dein paulo latior, cum femineo intus glaber; laciniæ basi altius cohærentes. Petala fem. subulato-setacea, calyce duplo breviora, glabra. Disci glandulæ utriusque sexus crassæ, truncatæ, glabræ, albidæ. Antheræ apertæ 1⅓ mm. longæ demum longiuscule exsertæ. Capsulæ 7-8 mm. longæ, subglobosæ, truncatæ, leviter 3-sulcatæ, pilis stellatis rigidulis densis ferrugine-argillaceis tomentellæ. Styli dense tomentelli, superne parte gracili glabrescentes. Semina 5 mm. longa.

Habitu similis *C. lanato*, Lam., sed ambitus foliorum angustior, folia non longe trinervia, filamenta basi longiusculo tractu valde vestita, capsulæ multo majores et calyx fem. dein nullomodo anisolobus. A *C. campestri* præter alia jam foliis glanduligeris differt. Juxta *C. flaventem* systemati inserendus est. Species distinctissima egregio detectori dicata est.

Habitat in alveis fluminis prope Cordoba, in Republ. Argentina: Lorentz, n. 289, *in hb. Eichl. et hb. DC.*

4. CROTON MYRIODONTUS, *Müll. Arg.*, petiolis limbo 4-6-plo brevioribus, limbo basi abbreviato-palmatinervio cæterum penninervio ambitu angusto margine minute myriodonto denticulis glandulosis, stipulis indivisis e basi triangulari lanceolato-acuminatis tota longitudine breviter glanduloso-ciliolatis, bracteis, 1-floris linearibus subelongatis more stipularum glanduloso-ciliatis bracteolis parvis triangularibus cæterum bracteis conformibus, calycis fem. arcte sessilis laciniis oblongo-ovatis acutis utraque facie vestitis dorso juxta marginem pluriserialiter glanduloso-setuligeris, disci hypogyni lobis brevissimis, ovario hirsuto, stylis basi breviter connatis 4-fidis tenellis, seminibus lævibus.

Fruticulus circ. pedalis, erectus, superne ramis suberectis paucis ornatus, tota longitudine foliosus. Caules inferne 2-2½ mm. lati, denudati, fuscescentes, nitiduli, cæterum tota longitudine cum petiolis indumento sordide albello v. fulvescenti-albido patente densiusculo villosuli. Stipulæ 3-5 mm. longæ, firmæ, inferne dorso pubescentes, cæterum glabræ. Petioli 6-8 mm. longi, tenues. Limbus foliorum 3½-4 cm. longus, 10-12 mm. latus, lanceolatus, acutus, v. subacutus, basi obtusus, margine dense glanduloso-serrulatus, supra pubescens, subtus villoso-tomentellus, junior subtus albo-tomentosus, dein incanus, demum subviridis; costæ tenues. Spicæ circ. longitudine foliorum, basi flores fem. 4-5 compactos gerentes. Bracteæ 4 mm. longæ, bracteolis multoties longiores, margine utrinque glandulis oblongis breviter stipitatis ornatæ. Calyx fem. sub fructu 9 mm. longus; laciniæ extus secus marginem setulis rigidis brevibus glandulas fuscas gerentibus ornatæ cæterumque dorso fulvescenti-tomentosæ, intus stellato-pubescentes. Petala fem. suppressa. Discus hypogynus brevissimus, glaber. Ovarium tomentoso-villosum. Styli gracillimi, minute fulvo-pubescentes. Capsulæ 6 mm. longæ. Semina 5 mm. longa.—A proximo *C. serratifolio*, Baill., recedit foliis ambitu latioribus, stipulis, capsulis et seminibus minoribus et disco hypogyno omnino alio.—Flores masc. ignoti.

Habitat in collibus saxosis Las Peñas prope Cordoba in Republ. Argentina: Lorentz, n. 290; *hb. Eichl. et fruct. in hb. DC.*

5. **Croton glandulosus** β. **Cordovensis**, *Müll. Arg.*, ramis et petiolis longe patenter hispidis, foliis inferioribus longe petiolatis superioribus s. ramulorum ultimorum mediocriter petiolatis amplis ovatis grosse duplicato-dentatis tenuiter membranaceis illis longius his breviuscule palmatinerviis, glandulis stipellaribus et bracteolaribus subclavatis sub apice capitato contractis setaceo-stipitatis, calyce fem. valde anisolobo majusculo.

Similis *C. glanduloso* α *hirto*, sed pili caulium tenuiores, pallidiores, inferiores vix retrorsum spectantes, foliorum limbus multo tenuior sed eodem more amplus et grosse dentatus, calyces fem. sub fructu demum 8-9 mm. æquantes. Capsulæ 5 mm. longæ. Semina 3-4½ mm. longa, 2½-3 mm. lata. Cætera visa ad amussim cum *α hirto* quadrant. Flores masc. ignoti.

Habitat in fruticetis et silvaticis umbrosis prope Cordoba in Republ. Argentina: Lorentz, n. 294, *in hb. Eichl. et hb. DC.*

6. **Julocroton subpannosus**, *Müll. Arg.*, caule fruticoso, ramulis compresso-angulosis, petiolis limbo circ. 3½-4-plo brevioribus, limbo palmatinervio pilis stellatisadpressis mollibus cinereo-albidis utraque pagina tenuiter pannoso incrassato, stipulis setaceo-linearibus elongatis indivisis, floribus capitatis capitulo ovoideo, bracteis setaceo-linearibus elongatis, bracteolis conformibus sed minoribus, calycis fem. laciniis 3 rhombeo-ovatis profunde pinnatifidis lacinulis linearibus elongatis adscendentibus diametro rhacheos lanceolatæ pluries longioribus, petalis masc. lineari-spathulatis undique puberulis femineis obsoletis, disco hypogyno hinc 3-partito glandulis ovatis obtusis fere omnino adnatis stellato-pubescentibus, staminibus 11, filamentis undique pubescentibus, antheris 2½-plo longioribus quam latis, ovario tomentello, stylis inferne longiuscule connatis 4-fidis oblique insertis, seminibus præsertim latere ventrali minute ruguloso-subasperis.

Frutex humanæ altitudinis. Rami penultimi et ultimi spurie ditrichotome divisi, tomento stellari albido-fulvescente denso superficie crispulo vestiti, nonnihil curvati, v. subarcuato-adscendentes, inferne longiusculo tractu aphylli, superne subconfertim 2-5—phylli et inflorescentia circ. 2½ cm. longa fereque totidem lata terminati. Stipulæ circ. 1 cm. longæ, curvatæ, villosulæ. Petioli 1-1½ cm. longi, indumenti copia incrassati. Limbus foliorum 5-7 cm. longus, 2½-3½ cm. latus, rhombeo-ovatus, acuminatus, basi obtuse acutatus v. junior subobtusus, margine minute subappendiculato-denticulatus, longe quinquenervius;

costæ secundariæ in parte superiore limbi utrinque vulgo solitariæ. Indumentum paginæ superioris virescenti-incanum, densum, haud crassum, paginæ inferioris paulo longius sed similiter arcte pannoso-intricatum et adpressum, magis cinereo-albidum v. primum flavicanti-albidum. Bracteæ 5-7 mm. longæ, valde angustæ. Pedicelli fem. 2 mm. longi. Calyx fem. sub fructu 10 mm. longus, laciniæ ambitu acuminatæ, utrinque lacinulas 4-6 lineares 3-4 mm. longas patenti-adscendentes dense villoso-tomentosas gerentes, intus infra medium fascia lanceolata glabra fusca notatæ, duæ exiguæ et integræ. Calyces masc. aperientes 8. mm. lati, laciniæ 3 apice dorso minute cristatæ. Ovarium albido-tomentellum. Capsulæ 5 mm. longæ. Semina 4 mm. longa, 3½ mm. lata, nitida, subplumbea, dorso fere lævia.

Similis *J. Montevidensi*, sed semina haud lævia, et *J. serrato*, a quo altitudine, petiolorum longitudine et limbo foliorum nec non disco hypogyno vestito differt.

Habitat in silvis montanis humidis simulque subcalidis prope Ascochinga in Republ. Argentina: Lorentz, n. 291, *in hb. Eichl. et hb. DC.*

(*To be continued.*)

SHORT NOTES.

Polygala austriaca, *Crantz.*—I had an opportunity the other day (June 15) of revisiting the locality on Wye Down, in Kent, where three years ago I was fortunate in discovering *Polygala austriaca*. On that occasion I gathered specimens from two spots in the neighbourhood of Coombe farm, in one of which it is very plentiful this year. This time I came upon another small patch of it about a quarter of a mile from the latter, and at a considerably higher level. Though undoubtedly a rare plant, its area will no doubt be further extended in the county, if not to other parts of England.—J. F. Duthie.

Rumex Caldeirarum, *Watson.*—At p. 36 I referred an immature specimen in the Kew Herbarium from the Azores (Hunt, n. 216) to this name, and stated that I believed the specimen to be *R. maximus*, Schreb. Mr. Watson, however, in an appendix to his "Topog. Bot." (p. 744) says that *R. Caldeirarum* has "deeply cordate and very obtuse root-leaves and perianth almost wholly destitute of tubercles." These characters, which of course quite remove *R. Caldeirarum* away from *R. maximus*, are not shown in the poor and insufficient specimen to which alone I referred.—Henry Trimen.

Galeopsis speciosa, *Miller.*—There can be little doubt that as has been already stated by Bentham (DC. Prod., vol. xi.), p. 498), the *Galeopsis speciosa*, named and characterised by Philip Miller, in 1771, in the sixth edition of his "Gardener's Dictionary," is the same species that was named *G. versicolor* several years later by Curtis. The following is what Miller says about it :—"3. Galeopsis (*Speciosa*), corollâ flavâ, labio inferiore maculato. Flor. Lapp., 193. Prickly Hemp Dead Nettle, with a beautiful yellow flower, and purple lips. . . . The third sort grows chiefly in the northern counties, but I have accidentally found it growing wild in Essex, within ten miles of London." This was published in 1771. I do not know the exact date of the name *versicolor*, which was issued in the sixth fasciculus of the "Flora Londinensis." The publication of this latter work extended over ten years, but did not begin till 1777, so that *speciosa* has a clear priority, and I see it has been adopted by Crépin in his second edition of his "Manual of the Belgian Flora." —J. G. Baker.

Carex depauperata, *Good.*—I had the pleasure of finding this plant on the 25th of May last in what I suppose to be a new station, viz., in a chalk-pit near Effingham, Surrey, two or three tufts only were seen. *Carex depauperata* in its young state somewhat resembles *C. sylvatica*, Huds.; can it have been passed over in other places for this plant?—Walter W. Reeves.

Lathyrus sphæricus, *Retz.* in Herts.—I send specimens of a *Lathyrus* from Cole Green, in this county. It seems confined to one spot, a dry gravelly bank by the roadside, where there must be at least fifty specimens apparently of different ages; they extend for some yards along the bank in company with the commonest wayside weeds *Cynosurus*, *Dactylis*, *Trisetum*, *Crepis virens*, *Convolvulus arvensis*, *Lathyrus pratensis*, &c., and look as much at home as any of them; in the adjoining field (beans) are *Papaver Argemone*, *Galeopsis Ladanum*, *Ranunculus arvensis*, &c. The locality is near a railway-station, but not on the actual road to it (which I carefully examined, as also a small brickfield beyond) and the manure and other agricultural matters would not pass it, as all the neighbouring farms are in another and opposite direction. The plants are healthy-looking, and the pods (immature) full of seed. There are no traces of any other exotics in the neighbourhood of the spot, which is sequestered, with no regular village within some distance.—R. A. Pryor. [The plant is *L. sphæricus*, Retz., a native of southern and western Europe, reaching in West-central France to Tours, Poitiers, and Angers, but not found in the latitude of Paris, and absent from the Belgian Flora. The flowers and pods present great similarity to those of *L. Nissolia*, and the long narrow leaflets, one pair to each leaf further carry out the first-sight resemblance. Though probably introduced into Hertfordshire there is hardly sufficient evidence at present for drawing a definite conclusion.—*Ed. Journ. Bot.*]

Extracts and Abstracts.

OFFICIAL REPORT FOR 1873 OF THE DEPARTMENT OF BOTANY IN THE BRITISH MUSEUM.

By William Carruthers, F.R.S.

The serious interruption to the important work of incorporating plants in the General Herbarium, caused by the crowded state of the Cabinets recorded in the report of last year, has been overcome by the very large addition to the Herbarium during the past year of eighty-five large and forty-three smaller cabinets. This important addition has been fully taken advantage of; a large portion of the Herbarium has been further re-distributed, and room has been secured for the incorporation of numerous collections. This work of incorporation has been actively carried on throughout the year, and during its progress the following natural orders have been more or less completely re-arranged:—*Anonaceæ*, *Papaveraceæ*, *Capparideæ*, *Resedaceæ*, *Violaceæ*, *Caryophylleæ*, *Dipterocarpeæ*, *Geraniaceæ*, *Oxalideæ*, *Burseraceæ*, *Meliaceæ*, *Ochnaceæ*, *Olacineæ*, *Anacardiaceæ*, *Euphorbiaceæ*-*Connaraceæ*, *Rosaceæ*, *Crassulaceæ*, *Onagrarieæ*, *Passifloreæ*, *Cucurbitaceæ*, *Umbelliferæ*, *Hederaceæ*, *Loranthaceæ*, *Caprifoliaceæ*, *Dipsaceæ*-*Lobeliaceæ*, *Campanulaceæ*, *Asclepiadaceæ*, *Borraginaceæ*, *Convolvulaceæ*, *Hydroleaceæ*, *Scrophulariaceæ*, *Moreæ*, *Orchidaceæ*, *Juncaceæ*, *Cyperaceæ*, *Gramineæ*, *Filices*, *Lichenes*, and *Fungi*.

The following collections have been either entirely or in part incorporated in the General Herbarium. The plants of Malta and Italy, collected by Duthie; of Caucasus and Siberia, by Fischer; of Persia, by Loftus; of India, by Wallich, and Hooker and Thomson; of Java, by Zollinger; of Kamtschatka, by Captain Cook; of Abyssinia, by Rüppell, and Schimper; of Algeria, by Paris; of Ashantee, by Tedlie; of Congo, by Ch. Smith; of Western Tropical Africa, by Perrottet; of the Cape of Good Hope, by Bowie; of Oregon, by Hall; of Cuba, by Ramon de la Sagra; of the Antilles, by Husnot; of South America, by Dombey, Spruce, Jameson, and Ruiz and Pavon; and of the Falkland Islands, by Havers. Besides these, the desiderata from the Herbaria of Edward Rudge and of John Smith have been placed in the Herbarium, as well as a considerable portion of the plants of the *Hortus Cliffortianus*.

A large portion of the important Herbarium of British Plants, presented to the Trustees by Dr. Trimen, has been incorporated with the British Herbarium.

The original drawings of "English Botany," together with the engraved plates prepared from them, and belonging to the first and last editions of that work, have been partly mounted and arranged; they are placed for preservation in Solander cases. The series of original drawings by F. Bauer, illustrating the growth of the wheat plant, and the diseases which attack it, have also been mounted for preservation.

An important collection of botanical illustrations has been formed during the year; upwards of 6000 figures of plants having been arranged in systematic order, in a series parallel to the Herbarium.

The following are the principal additions to the collections of the department during the year 1873:—

1.—*To the Herbarium.*

General Herbarium. Phanerogamia.—240 species from Greece and Crete; collected by Dr. Heldreich: 300 species from Central Europe, forming three centuries of Schultz's Herbarium Normale: 35 species of critical plants from Denmark and Finland; presented by Dr. Trimen: 128 species from Malta; collected and presented by J. F. Duthie, Esq.: 90 species from Morocco; collected by Schousboe: 98 species from Blidah; collected by Lefebvre: 595 species from Suez, Arabia, and Abyssinia; collected by Dr. Hildebrandt: 85 species from South Africa; collected and presented by Dr. Shaw: 564 species of Madagascar plants collected by Hilsenberg and Bojer: several species of Solanum from Cape Colony; presented by Sir H. Barkly, K.C.B.: A parcel of plants of Little Namaqua-land; presented by R. Trimen, Esq.: 458 species from Madeira; collected by Mandon: 25 specimens of Cinchona from the Government Plantation at Ootacamund, Neilgherries; presented by Clements R. Markham, Esq., C.B.: 850 species from Texas; collected by E. Hall: 525 species from California; collected by Kellogg: 384 species from Mexico; collected by Ghiesbrecht: 106 species of Glumaceæ from the Antilles; collected by Husnot: 60 species from Western Australia; collected by Brewer: 256 species from New Caledonia; collected by Vieillard and Deplanche.——*Cryptogamia.*—A complete set of Mougeot and Nestler's European Cryptogams: 154 species of Ferns from the Antilles; collected by Husnot: 134 species of Ferns from Guadaloupe; collected by L'Herminier: 58 species of Hepaticæ and Mosses from the Antilles; collected by Husnot: 300 species of Mosses of Normandy; collected and named by Ettienne: 150 species of Mosses of Europe; prepared by Rabenhorst: 230 species of Lichens from the Channel Islands; collected and named by M. Larbalestier: 30 species of Lichens from the Antilles; collected by Husnot: 18 species of Fungi from the Antilles; collected by Husnot: 500 species of European Fungi; collected and named by Thümen: 200 species of Fungi; prepared by Rabenhorst: 900 species of European Fungi; collected and named by Karsten: 90 species of Algæ; prepared by Rabenhorst: 432 species of Cryptogams from Burma; collected and presented by S. Kurz, of Calcutta.

British Herbarium. Phanerogamia.—A large Herbarium of British plants, including the plants enumerated in the "Flora of Middlesex," consisting of about 3000 sheets; presented by Dr. Trimen: 100 species, presented by the Rev. J. C. Elliott: 50 species of rare and critical Irish plants, collected and presented by A. G. More, Esq.: specimens of *Lathræa* from the Rev. W. Fox: specimens of *Carex punctata* from Pembrokeshire; presented by C. Bailey, Esq. ——*Cryptogamia.*—50 species from Oxford, forming part of Baxter's "Stirpes Cryptogamicæ Oxon.": 10 species of recently-determined British Mosses; presented by C. P. Hobkirk, Esq.: specimens of *Sphagnum Mulleri*; presented by Dr. Braithwaite: 100 species of Fungi; collected and prepared by J. English: 100 species of *Sphæria*; collected and named by C. B. Plowright: 450 species of Lichens; collected by the Rev. J. M. Crombie: 100 species of Lichens from Wales; collected and named by the Rev. W. A. Leighton.

II. *To the Structural Series.*

a. Fruit Collection.—Fruit of *Hæmatocarpus Thomsoni*; presented by J. Miers, Esq.: Fruit of *Pandanus* from New Caledonia, collected by Pancher: 2 Cucurbitaceous fruits from Mexico.——*b. General Collection.*—Stems of *Styrax*, *Nicotiana*, and *Ferula*; presented by M. Moggridge, Esq.: Stems of *Phœnix*, *Pandanus* and *Cycas*, from Travancore: 2 Palm (*Kentia*) stems and two Fern Stems from New Caledonia, collected by Pancher: 69 specimens of woods from New Caledonia; collected by Pancher: 2 stems of Hemitelia; presented by R. Trimen, Esq.: Specimens, dissections and drawings of *Apodanthes*, *Langsdorffia*, and *Helosis*; presented by J. Miers, Esq.: 90 preparations illustrating the structure and fructification of British Fungi; prepared by M. C. Cooke.

III.—*To the Fossil Series.*

122 sections of Carboniferous Fossils; prepared by J. T. Norman: 4 fossil fruits from the Miocene of Corfe, Dorset: 2 specimens of fossil wood from the Crag of Sussex: specimen of a rare fossil Cycad *Mantellia pygmæa*: portion of a trunk, about 40 ft. long and 4 ft. in diameter of *Araucarioxylon*, from Craigleith quarry, near Edinburgh; presented by T. S. Hunter, Esq., through Sir Rober Christison, Bart.: section of a small stem of *Araucarioxylon;* presented by Professor Balfour: 2 specimens of Coniferous wood from the chalk; presented by H. Carr, Esq.: specimens of wood in flint and chalk, and two specimens of fossil Charas: 12 specimens of fossil plants; presented by Sir Philip Egerton, Bart.: trunk of a Coniferous tree converted into jet, from Spain.

The number of visits paid during the year to the Herbarium for the purpose of scientific research, was 1020. The following foreign botanists may be specified as having used the Herbarium in prosecuting their various studies:—Berggren, of Stockholm, for his work on the plants of Greenland; Reichenbach, of Hamburg, for his work on *Orchidaceæ*; Micheli, of Geneva, for his memoir on *Onagrarieæ*; and Dr. Shaw, of Colesberg, South Africa, for his investigations into Mosses and South African plants. Of botanists residing in Britain, who have made use of the Herbarium, the following may be specified:—Mr. J. Miers, for his monographs of the *Lecythideæ* and *Apocyneæ;* Mr. G. Bentham, for his "Flora Australiensis"; Mr. W. P. Hiern, for his monograph of the *Sapindaceæ*, for the "Indian Flora"; Dr. M. T. Masters, for his memoirs on *Malvaceæ* and *Olacineæ* for the "Indian Flora"; Mr. D. Hanbury, for his investigation of officinal plants; Mr. E. M. Holmes, for his papers on Algæ and Economic plants; Professor M. A. Lawson, for his memoir on *Celastrineæ* for the "Indian Flora"; Dr. Braithwaite, for his work on the Mosses of Britain; the Rev. J. M. Crombie, for his publications on British Lichens; Mr. M. C. Cooke, for his work on Fungi; Mr. B. D. Jackson, for his investigations into the History of English Botany.

REPORT FOR THE YEAR 1873 OF THE HERBARIUM AND LIBRARY OF THE ROYAL GARDENS AT KEW.

By J. D. Hooker, C.B., M.D., F.R.S.

Herbarium.

Upwards of 21,000 herbarium specimens have been received (chiefly presented) from all parts of the world, including many valuable collections, amongst which the following are especially worthy of notice: The Rev. H. E. Fox; Sinai and Palestine Herbarium, of about 1,000 species, formed by his cousin the late W. Amherst Hayne, M.A. Dr. Rein and Baron Frisch; South Marocco and Atlas mountain plants, 463 species. Mr. Thos. Cooper; South African plants, 3000 species (purchased). M. Maximowicz, on the part of the Imperial Academy of St. Petersburg; upwards of 600 Japanese and Saghalien plants. Dr. Regel, on the part of the

Imperial Botanic Gardens; 300 Russian and Altai, and 540 Brazilian species. Dr. Brandis; Thompson's Oudh Herbarium, 542 species. Queensland Government, through R. Daintree, Esq.; 250 species from the Cape York Peninsula. The Challenger collections from the Bermudas, Cape de Verd Islands, and Fernando Noronha, formed by Mr. Mosely. M. Cosson (Paris); Hahn's Martinique plants, 400 species. E. C. Reed's Chilian collections, 2000 species (purchased). Rev. J. E. Leefe's Cryptogamic Herbarium, containing upwards of 1000 named species of British Lichens, Fungi, &c. Professor A. Gray, of Cambridge, Massachusetts; many very important collections from California, the Rocky Mountains, Cuba, and Mexican mountains. Dr. Reinsch's European Mosses, about 1000 species. Dr. Shaw's South African collection from Albany, Griqua land, about 350 species. John Hunt, Esq., the Herbarium of British Mosses of his late brother George Edward Hunt: this magnificent herbarium is, with the exception of that of the late W. Wilson (specimens of whose collection are in the Kew Herbarium), the richest in point of specimens, and the most complete illustration of the British Muscologia ever formed. Sir Paul Molesworth, Bart.; the British and Foreign Herbarium formed by his sister the late Miss Molesworth, of Cobham.

The [other] principal contributors to the Herbarium . . . . have been:—

EUROPE.—Eaton, Rev. A. E.; Spitzbergen plants. Freeman, E. P.; Bosnian plants. Janka, Victor von; Turkish plants (purchased). Pichler, T.; Dalmatian plants. Plowright, C. B.; British Sphæriæ (purchased). Reichenbach, Prof.; Willows. Shaw, Dr.; Scotch Mosses. Smith, Mrs. A. M.; Tyrol plants. Smith, W. G.; British Fungi. Thiselton Dyer, Prof.; cultivated plants from the Royal Horticultural Society, Chiswick.

ASIA.—Aitchison, Dr.; N. W. Indian plants. Beddome, Col.; plants from Peninsula of India. Benson, Col.; Indian Fodder Grasses. Blomfield, Capt.; Japanese plants. Bulger, Major; Birmese plants. Colville, W. H. (per Dr. Sharpey); Bagdad plants. Cosson, M.; Peronin's plants of Asia Minor. Glover, Sergt.; Persian plants. Hance, Dr.; Chinese plants. Markham, G. C. R., C. B.; Nilghiri Cinchonas. Mysore, Chief Commissioner of; fodder grasses. Perry, J. W. (H.M.S. *Pearl*); plants from Amsterdam Island. Pike, Col.; Mauritian Algæ. Rabenhorst, L.; Chinese Lichens (purchased). Thwaites, G. H. K.; Ceylon plants. Woodrow, —; plants from Western Ghats.

AFRICA.—Barber, Mrs.; plants from the Diamond Fields. Barkly, H. E. Sir H.; Cape plants. Bolus, H.; Cape plants. Buchanan, Rev. J.; Natal Ferns. Frere, the Right Hon. Sir B.; plants of E. Tropical Africa. Harvey, the late Dr. (through Prof. E. P. Wright); Cape plants. Horticultural Society, Royal; duplicates of Cooper's Cape plants. Kirk, Dr.; plants from Zanzibar and the Somali coast. Leefe, Rev. J. E.; Nubian and Abyssinian plants. M'Owan, P.; Cape plants. Monteiro, J. J.; Angolan plants. Schweinfurth, G.; Rubiaceæ of the Nile-land. Tuck, —; plants from the Diamond Fields. Warion, Dr.; Algerian plants (purchased).

AMERICA.—Bebb, M. S.; plants from Illinois. Bennett, A. W.; Brazilian plants. Eaton, Dr.; Mexican Ferns. Finlay, Kirkman;

Trinidad plants, Glaziou, A.; Brazilian plants. Husnot, T.; West Indian plants (purchased). Jardin des Plantes, Paris; Mexican Cryptogams. Leggatt, N.; American species of *Lechea*. L'Herminier, M.; West Indian Ferns (purchased). Markham, Capt.; Arctic plants. Middleton, M.; Bermuda plants. Nuttall, Dr. R. K.; Rocky and Cascade Mountains. Patin, C.; photographs of New Grenadan Orchids. Siler, A. L. (through Dr. Masters); Utah plants. Veitch, Messrs.; Bruchmüller's N. Grenadan plants. Warming, E.; Brazilian *Mimoseæ*. Watt, D. A.; Hall's Texan plants.

AUSTRALIA, NEW ZEALAND, AND PACIFIC ISLANDS.—Cheeseman, F. F.; New Zealand plants. Jardin des Plantes, Paris; New Caledonian plants. Kirk, T.; New Zealand plants. Lombe, Rev. E.; New Zealand Ferns. Macleay, the late G.; Tasmanian Algæ. Mueller, Baron v.; Australian plants. Wyatt Gill, Rev. W.; Hervey Islands plants.

The accommodation for the Herbarium, and for the scientific visitors who resort to it, is now quite inadequate. Hitherto it has been lodged, by permission of her Majesty, in an old building, formerly the residence of the Duke of Cumberland, in the private grounds adjoining the Botanic Garden. This Herbarium is now by far the most extensive and complete in Great Britain, if not in Europe, and is the depository of the principal Government collections formed during the last half century, and of information on all branches of Botany, Forestry, and the vegetable resources of India and of the colonies, and as such is in constant use in preparing official reports for various departments of the public service, especially the India Office, Colonial Office, and Foreign Office. On this account no less than in the interest of science, it is most desirable that a commodious building should be constructed for its accommodation, together with the very valuable library and collection of MSS. and drawings attached to it. It is hardly necessary to observe that in the construction of such a building every precaution against the occurrence and spread of fire should be adopted.

LIBRARY.

The following important donations have been made:—The MSS. of the late J. W. Masters, who resided many years in Assam, and formed large collections there which are deposited at Kew. The MSS. of Dr. Roxburgh's "Flora Indica," presented by his son Col. Roxburgh. A copy of "Hill's "Vegetable System," a very rare work, in twenty-six folio vols.; presented by Henry Doubleday, Esq. A beautiful series of drawings of plants, presented by W. G. Smith. The catalogue of Röttler's East Indian Herbarium, prepared by himself, and preserved at Madras, has been presented by the Secretary of State for India, with the view of its being deposited with Röttler's Herbarium at Kew.

THE BOTANICAL CONGRESS AT FLORENCE.

(*Continued from p.* 187.)

May 16*th*.—The ceremony of unveiling the bust of Webb took place soon after two o'clock in the room of the museum in which are preserved the rich collections of plants which he bequeathed to the Grand Duke of Tuscany. Prof. Targioni Tozzetti having uncovered the bust, read in the name of Prof. Parlatore an eloquent address in Italian, of which the following is the substance:—It was probably about the year 1819 that Webb began to travel abroad for the study of botany and to lay the foundation of his vast collections. Passing through Switzerland he visited Italy, and commenced to collect in the neighbourhood of Naples; from here he went on to the Ionian Islands, Greece, Turkey, and Asia Minor. In 1826 his herbarium was largely added to, during his visit to Spain and Portugal, both by the plants which he himself collected and those which were given to him by botanists of those countries. In 1827 he explored a portion of Morocco, and ascended the Lesser Atlas: there are plants also in his herbarium from the neighbourhood of Oran. After this he passed some time in Madeira, Porto Santo, and in the Canary Islands. Here it was that his most important work was accomplished, and from which resulted the valuable volumes entitled, "Histoire Naturelle des Iles Canaries," which he undertook in conjunction with his companion Berthelot, whose acquaintance he made in these islands. Having collected the necessary materials for this object he proceeded to Paris, where he bought a house which became a centre of attraction to many of the scientific men of the age. Some years after this he took up his abode in Florence, where he became the friend of Parlatore and of Leopold II., who was at that time the patron of science, and especially of botany. Webb had a desire to remain in Florence, but circumstances obliged him to return to England and afterwards to Paris, where he died in 1854. In his will, signed 1850, he left to the Grand Duke his herbarium and library, and he also directed that the proceeds of the sale of his house in Paris should be spent for the purpose of keeping them in preservation. and for adding to them from time to time. His library consists of about 5000 volumes, besides a great number of miscellaneous pamphlets. The general herbarium contains, in addition to the plants collected by himself, several important collections, such as that of the Spanish botanists Ruiz and Pavon, containing about 4000 species collected in Peru and Chili; of the French botanist Labillardière, who collected largely in Syria, and whose herbarium also contains many plants obtained from celebrated botanists of his time, such as Thunberg, Allioni, Bellardi, Commerson, &c.; of Desfontaines, who spent three years in the districts of Tunis and Algiers for the purpose of studying the flora; and of Mercier, the Swiss botanist, chiefly composed of plants collected in the Pyrenees and in Corsica. Besides these there are special collections, representing the floras of the Canary and Cape de Verd Islands. . . . At the conclusion of Prof. Parlatore's address, which was loudly applauded, Dr. Bolle, of Berlin, made some touching remarks on the character of his friend Webb, whose acquaintance he had made in the Canary Islands. He expressed regret at the absence on this occasion of Berthelot and Parlatore, and finally, having remarked how much Webb appreciated the works of Alexander von Humboldt, appropriately placed round the base of the bust a wreath of ivy which he had gathered from the tomb of the author of "Cosmos."

May 18th.—The second meeting of the Congress took place on Monday, at one o'clock. Prof. Schimper proposed M. Alphonse De Candolle as president, who, after returning thanks, called on M. Carl Koch to read his communication on Bamboos. M. Koch exhibited several specimens which had been sent to the exhibition by Prince Troubetzkoy. from his garden at Intra. The object of the paper was to define the specific characteristics of these plants by means of their leaf appendages and by the nature of the ligules, whether represented by hairs or not.—M. Tchistiakoff followed with remarks on the development of the pollen grains of *Coniferæ*. He observed that there were three types; in the first there are no traces of division, such as is the case in *Sequoia*; in the second type, as in *Thuia*, there are indications of division; and in the third there is a true division with partitions, as is seen in *Pinus* and *Abies*. The author concluded by comparing these pollen-grains with the reproductive organs of some of the Cryptogams.—A paper was read by M. Radlkofer on some anomalous stems belonging to the *Sapindaceæ*, which includes some of the climbers known under the name of Lianas. Their stems are very irregular, some examples have in addition to the original central cylinder of wood other centres placed externally to it, the whole being enclosed by cambium and bark. In others the woody layer is divided into five large lobes, each possessing its own cambium, and there is another modification, where there are three sets of woody zones, which form round the circumference of the medullary sheath, giving the stem a triangular shape, and a tendency to divide into three parts. The author then showed how these anomalous structures are suited to the mode of growth of the plants, by giving them rigidity, pliancy and tenacity according to their requirements.—M. Weddell introduced for discussion a subject which is now becoming much agitated amongst botanists, viz., as to the nature of the filamentous portion of Lichens known under the name of the hypha. The enclosed green Gonidia have latterly been considered by many botanists to be Algæ, whilst the hypha is looked upon as a Fungus; the Lichen thus consisting of two distinct plants combined. M. Weddell felt convinced that these Gonidia were Algæ, he is of opinion, however, that there is no parasitism but the two growths are simply co-existent. M. Famintzin did not think that the question could be thus disposed of, as it had been, he believed, established that the Gonidia were formed by means of the transformation of the hypha. Prof. Caruel remarked that this proves what he himself had been the first to observe ten years ago in the case of *Collema*. The discussion was taken up Prof. Gibelli, who gave the result of his observations on *Parmelia subfuscata*, by Sig. Delpino, Prof. Suringar, Prof. Schimper, and others.—This was followed by a long paper from Sig. Castracane on the reproduction of Diatoms in favour of the process taking place by germs. M. Pfitzer maintained his opinion that the process takes place by segmentation. —Mr. Hiern read a paper on the value to be attached to the determination of certain fossil leaves which have been referred to *Diospyros*, and other genera of *Ebenaceæ*. After a short discussion on the nomenclature of fossil plants, in which De Candolle, Schimper, and others joined, M. Chevallerie exhibited a piece of a silicified trunk found in the desert near the pyramids of Ghir.

May 20th.—M. De Candolle proposed M. Bunge as president, who, having returned thanks, called on M. De Candolle to deliver his communication on the causes of the distribution of rare plants on the Alps. The author explained that the preglacial Alpine flora was not able to exert a great influence on the existing flora, inasmuch as the great changes which took place during the glacial period had necessarily swept away this ancient vegetation. He could not agree with those who considered the Alps as a centre of diffusion of a special flora, but believed them rather to be the refuge ground for the plants, which, as the glaciers retired, had found conditions more favourable to their existence than in places lower down. In proof of this he observed that the richest parts of the Alps for rare plants are those which were soonest deprived of glaciers, the ground having been thus cleared for the introduction of a more ancient flora, of which these rare plants are remnants. The southern, the eastern, and the western slopes of the Alps were successively cleared of the principal glaciers, and the Swiss Alps received their flora first from the south, and then from the east and west. The author then asks, "Why should the plants ascend as the glaciers retreat, and why should there be greater variety in this advancing vegetation ?" In preglacial times there was more moisture in the climate of Europe, and consequently the flora was richer and more varied. After a time the climate became dryer, and as the glaciers retired many plants were able to maintain themselves, by advancing gradually over the ground as it became unoccupied by glaciers, finding there conditions more favourable for their growth. Hence one can deduce the law that the richness and variety of Alpine floras depend on the antiquity of their introduction.—Mr. Ball approved of M. De Candolle's theory to a certain extent, but he did not consider it sufficient to explain all the facts. When, for instance, a rare species is to be found in more than one locality, it is natural to suppose that formerly it had occupied all the intermediate ground, and that the glacier coming through the midst of it had divided it into two groups. He was also unable to understand how M. De Candolle's theory could explain the fact of certain plants growing vigorously in limited spots without extending their area, and was inclined to attribute this limitation to the nature of the rock, its chemical properties, &c.—serpentine, for instance, almost always supports a peculiar vegetation; thus the Engadine Valley, which must have very recently been freed from glaciers, is remarkably rich in rare plants.—M. Tchiatcheff remarked that in Asia Minor he could find no trace of glacial action which could help to explain the distribution of Alpine plants.—M. Timiriazeff read a paper on some investigations he had been making, upon the influence of light on vegetation. He explained the methods he had employed with the spectroscope. The conclusions he came to were that the rays which become absorbed most are those which have the greatest calorific intensity, and that where there is greater absorption of light there is at the same time greater chemical activity, a larger quantity of carbonic acid gas decomposed, and more moisture present. The formation of the tissues, and all the manifestation of vegetable life are the effect of the transformation of the calorific energy into mechanical work, and thus science gives truth to the beautiful words of the Italian poet—

> "Guarda il calor sol che si fa vino
> Giunto all' umor che dalla vite cola."

Prof. Suringar read a long paper on the mode of obtaining an equal estimation of microscopic measurements, and exhibited an instrument designed by himself, and explained the mode of using it.—M. Heldreich spoke on some new or rare species of plants found in Greece, and gave a description of a new *Glaucium*.—M. Galeznoff gave the result of his researches in calculating the amount of water contained in the different parts of a plant. By dividing a trunk into a number of pieces from the baseupwards, he found invariably that the quantity of water increases from the base towards the summit. Of the four species studied by him, he found *Pinus sylvestris* contained most moisture in the trunk, and *Acer* the least. *Betula* and *Populus tremula* were intermediate. In *Pinus* the bark is dryer than the wood, and in *Acer* more moist. In *Betula* it is dryer in the winter and spring, and more watery in summer and autumn. The contrary takes place in the case of the poplar. In the branches the same law holds good, but their bases are dryer than the portion of the trunk from which they take their rise; and the petioles are more watery than the leaves. In the flowers; the perianth, the filaments and the styles contain more water than the anthers.—M. Fischer gave a description of the development of *Ustilago*, and specially eof *U. Carbo*, *U. destruens* and *U. longissima*. He described the grmination of the spores, and explained how these parasites penetrate the plants from which they get their nourishment.—M. Baurodine gave an account of some experiments he had made on the production of carbonic acid gas during the germination of seeds. The amount of carbonic acid gas evolved is proportional to the degree of heat to which the seeds are subjected. Where there has been the greatest production of this gas, there the growth of the germinating plant has been most rapid. From his experiments M. Baurodine is convinced that the production of the tissues is the mechanical equivalent of the absorption of heat.—Prof. Arcangeli, of Leghorn, described the structure of the flowers of *Cytinus Hypocistis*, a parasite on certain species of *Cistus*. There are two varieties, one red and the other yellow. The red variety is found on *Cistus salviæfolius*, and the other on *C. monspeliensis*.

May 22nd.—M. Radlkofer having been elected president, Prof. Caruel read a list of some books and pamphlets which had been presented to the Congress, and which would be preserved in the library of the Natural History Museum. After which Dr. Moore read papers on a hybrid *Sarracenia* and on some plants indicative of the climate of Ireland, and exhibited many specimens.—Dr. Bargellini then spoke on the nature of microscopic parasites on man.—Prof. Lanzi called attention to the subject of *Bacteria*, which he maintained should be called "Schizophyti" rather than Schizospori; in fact their reproduction takes place by the division of a cellule which has nothing of the character of a reproductive organ; they are therefore strictly speaking without spores. He is of opinion that in structure they resemble Algæ, but that they approach Fungi in some respects.

—Prof. Arcangeli disagreed with this proposition, whilst Prof. Cesati and Radlkofer were inclined to uphold the views of Prof. Lanzi.—Prof. Orphanides exhibited a beautiful collection of rare plants from Greece, and made a few remarks on each.—Baron Sternberg read a paper containing a revision of the genera of *Salsolaceæ.*—Prof. Gennari, of Cagliari, made some observations explanatory of the origin of insular floras; also on the relation that exists between vegetation and temperature.—Baron Cesati gave the history of a little-known plant described by Tenore, belonging to the genus *Guarea.*—The president then announced the termination of scientific communications, and the Congress was brought to a close by votes of thanks to Prof. Parlatore, M. De Candolle speaking very highly of the state of efficiency of the Florence Herbarium, to Signor Peruzzi, the Marquis Ridolphi, the Royal Horticultural Society of Tuscany, and the Secretaries to the Congress. On the motion of Prof. Cesati it was also resolved that salutations be sent to those botanists who though over eighty years of age were still examples of hard work to the younger ones, and instanced Profs. Fries, Reichenbach and Ehrenberg, Berthelot and others. The proceedings then terminated.

Notices of Books.

Manual of British Botany : Containing the Flowering Plants and Ferns arranged according to their Natural Orders. By C. C. Babington, M.A., F.R.S., &c., &c. Seventh edition, corrected throughout. London : Van Voorst, 1874. (Pp. lxiii., 473.)

It is somewhat rare for a scientific treatise to reach a seventh edition, yet two other British Floras have even exceeded that number. Withering's "Botanical Arrangement" which first appeared in 1776, reached an eighth edition in 1840, and Sir W. Hooker's "British Flora" first published in 1830, passed through the same number of editions in less than half the time, ed. 8 being printed in 1860. But in neither of these standard books were the successive issues all revised by the original authors. In the former case Dr. Stokes, Dr. Withering, junior, and Mr. Macgillivray, successively edited the book, and in the latter Dr. Walker Arnott had the management of the three last editions. The "Manual of British Botany" has had the very great advantage of the author's careful correction in each edition. At its first appearance in 1843, its short clear descriptions, facility for ready reference, and portability made it at once a favourite text-book for practical botanists, and in spite of some faults in construction and the competition of the various other English Floras which have since appeared, a steady demand has necessitated a new edition of the Manual every five or six years. As a field companion it still remains the best; the thin-paper copies being a little over 7 inches by 4 and not ¾ in. thick, whilst the book does not weigh 10 oz. in its thin leather cover.

The last edition was issued in 1867, and in the seven years which have since elapsed British Botany has been progressing in every direction. At that date Dr. Boswell Syme's great descriptive work was scarcely two-thirds complete, this has long since been finished, and we have also had Dr. Hooker's well-planned and comprehensive Students' Flora, and several books of less importance on native plants. In geographical botany, Mr. Watson has with untiring energy issued in rapid succession from 1868 the three parts of his "Compendium," a "Supplement" to that treatise, and finally a very useful "Topographical Botany" in two parts; several county and local Floras of more or less importance have also been printed in the same interval. As a contemporary record of progress in the study of British plants by the description of novelties, examination of characters and synonymy and discovery of localities, the pages of this Journal during the same period, will be found to be, thanks to the kind offices of many contributors, fairly complete and trustworthy.

The author appears to have fully availed himself of these and other sources of information (including the papers of M. Du Mortier in the Belgian Bulletin) with the result of somewhat numerous changes in nomenclature and arrangement, the addition of a good many species and varieties and some omissions. The nett result is that the bulk of the Manual is increased by about twelve pages only, whilst it is most thoroughly brought up to the date of its publication. A considerable saving of space has been made by the omission of descriptions and other details of the many cultivated, long extinct, or erroneously recorded species which found a place in former editions.

It would be impossible to enumerate the whole of the alterations which Prof. Babington has found it necessary to make in the volume, but some of the more important may be here pointed out. The most interesting are the additions, the bulk of which however, come within brackets as being introductions into this country. The following is a list of those new British plants, the history of most of which is known to the readers of this Journal:—

Ranunculus Chærophyllos, *L.* Jersey.
[Sisymbrum pannonicum, *Jacq.*]
[Potentilla norvegica, *L.*]
[Rosa pomifera, *Herrm.*]
[Portulaca oleracea. "Common weed near Richmond, Surrey"]
[Siler trilobum, *Scop.* "Naturalised."]
[Scabiosa maritima, *L.*]
[Aster salignus, *W.*, and A. longifolius.]
* Hieracium dubium, *L.*, *Fr.*
[H. præaltum, H. glomeratum and H. stoloniflorum*.]
[Xanthium spinosum, *L.*]
[Cuscuta approximata, *Bab.*]
[Veronica repens, *D.C.* "Naturalized at Manchester and York."]
Mentha hirsuta, *L.*, *Fr.* *M. pubescens*, Syme, E. B. Doubted as a species.

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* Misprinted *stoloniferum.*

[Plantago Timbali, *Jord.*]
[Rumex elongatus, *Guss.*]
R. maximus, *Schreb.*
[Euphorbia dulcis, *L.* "Llansilin . . Jedburgh."]
Callitriche obtusangula, *Le Gall.*
C. truncata, *Guss.*
Salix Grahami, *Borr.*
Allium carinatum, *L.*
Juncus pygmæus, *Rich.*
Potamogeton salicifolius, *Wolfg.* *P. Lonchites*, Tuck.
Zannichellia polycarpa, *Nolte.* "Swanbister Loch, Orkney. Dr. Syme!"
Psamma baltica, *R. & S.*
Aira setacea, *Huds.*
[* Poa sudetica, *Haenke.* "Several places near Kelso."]

In addition to these, *Pulmonaria angustifolia*, L., *Festuca oraria*, Dum. (*F. arenaria*, Osb., Bab.) and *Lastrea remota*, Moore, have been promoted from varieties to species; but as a counterbalance some twenty species of the former edition here rank as varieties, including *Valeriana sambucifolia*, Mikan, *Atriplex marina*, L., *Cystopteris dentata*, Sm. and *C. alpina*, Desv., and no less than five Roses. All these seem to be changes for the better, and render the book more consistent with itself and harmonious with the opinions of other botanists. It will probably be considered by many that 1777, which is said to be the number of species in the volume, is still too large an estimate of the Phanerogams and vascular Cryptogams in Britain.

In pointing out the principal changes in the text, it may be remarked that in quoting Mr. Hiern's paper on the *Batrachium* section of *Ranunculus*, the names of his "ultimate forms" should not have been given as species, since the author of the paper expressly states his opinion that he considers all to be properly placed as forms under a single species. The genus *Turritis* is abandoned in accordance with the views of most systematists, *T. glabra* becoming *Arabis perfoliata*, Lam.; *Königa* too falls into *Alyssum*. The genus *Rosa* has been remodelled in accordance mainly with Mr. Baker's review in the Linnean Society's Journal, and is much altered. In the Umbelliferæ the genera *Helosciadium*, *Bunium* and *Anthriscus* are suppressed, the species falling respectively under *Apium*, *Carum* and *Chærophyllum*. The common Earth-nut, however, is no more a *Carum* than a *Bunium*, and is better placed in a separate genus, as is done by Koch and adopted by Dr. Hooker in his "Students' Flora," (*Conopodium*). *Conium* is rightly stated to have no stripes or large vittæ, the surface of the seed is, however, covered with numerous delicate longitudinal channels, irregularly arranged. *Siler trilobum* is considered to be "naturalised," Prof. Babington still believing it to have been purposely sown in its single restricted locality. The tribes of the Compositæ have been revised, *Apargia* is changed to *Leontodon*, and the Dandelion becomes *Taraxacum officinale*. Ireland is omitted as a locality for *Erica ciliaris*, a careful examination with Mr. A. G. More, of the Clifden station, where *E. Mackaiana* is abundant, having failed to detect it. The Jersey and west country *Echium* is properly referred to *E. plantagineum*, L., and *Scrophularia*

Ehrharti becomes *S. umbrosa*, Dum.; this plant has several other aliases. The arrangement of the Mints has been improved, but the Corsican species *M. Requienii*, established as a weed in one spot in the West of Ireland, is not noticed. No notice has been taken of the restriction of *Atriplex erecta*, Huds., by Boswell Syme; the name is still kept by the author for the common cornfield weed. *A. farinosa*, Dum., has been adopted for *A. arenaria*, Woods; the plant has been lately shown to be the real *A. laciniata* of Linnæus, as was formerly considered. *Rumex sylvestris*, Wallr., stands as var. *β*. under *R. obtusifolius*, but *R. maximus*, Schreb., has the honour of specific rank apart from *R. Hydrolapathum*. An Irish locality is given for *Callitriche truncata* in Co. Cork, which one is glad to see, as the plant cannot now be detected at Amberley, where the few remaining ditches are choked with *Anacharis*; the figure, E.B.S., 2066, is erroneously quoted under *C. pedunculata*, as well as under *C. truncata* which it rightly represents; as the synonymy is somewhat confusing, a reference might as well have been given to vol. viii. of this Journal, p. 154, where the matter is set right. Passing on to the Monocotyledons we find *Narthecium* located among the *Melanthaceæ*, a better position than with the Rushes. Our native *Muscari* is determined not to be *M. neglectum*, Guss., and takes its old name *M. racemosum* again. *Wolffia* is very properly made a genus apart from *Lemna*, from which it differs in very important characters, and *Potamogeton compressus*, Sm., takes the name of *P. mucronatus*, Schrad. In the Grasses, the somewhat puzzling grass *Glyceria pedicellata*, Towns., is put with *G. fluitans* rather than with *G. plicata*; its characters are intermediate. It is satisfactory to find Hudson's name *Aira setacea* adopted by Prof. Babington for the grass called *A. uliginosa* by Weihe sixty-two years after: if the fairly understood principle of priority be held it is difficult to see how Hudson's name can be set aside. Yet in his English Botany (vol. xi., pp. 68, 69), Dr. Boswell Syme contends this should be done, on the ground that Hudson afterwards confounded his grass with the *A. montana* of Linnæus; and proceeds thus: "The practice of raking up an obsolete name is always highly objectionable, and the obsolete in the present case is not likely to be adopted. Publishing botanists will reserve to themselves the right of correcting their opinions during their lifetime, and if their views alter, will demand to be judged by their latest published opinions. In the case of *A. setacea*, no doubt Hudson's first impression was right, but an exceptional case like this is no ground for establishing a precedent for depriving botanists of the right to withdraw statements which they subsequently believe to be erroneous." Dr. Syme here it seems to me misses the mark. The question, of course, is not whether a botanist has liberty to alter his views—no one would think of arguing that point—but whether a published species satisfactorily described, when subsequently dropped by its author, or merged in another species, thereupon ceases to exist, and is to be passed over by all subsequent writers. If such were to be made the practice, one could never quote a species as of any author without consulting all his subsequent writings to see whether he might not have withdrawn it—a great inconvenience, with no practical object; for it can scarcely be held that in such a matter any injury is done to an author by adopting his earlier view in preference to his later one. For example, Mr. Bentham in 1846, published the *Scrophulariaceæ* in De Candolle's "Prodromus," and named and described there several species, which in his "Flora Australiensis," vol. iv., printed in 1869, he does not keep up, but reduces under other species. Other botanists, whose ideas of species may be in accord with those of Mr. Bentham at the former period, if they adopt the species he then made, are not relieved of the obligation of employing his names, because the views of this eminent systematist have altered during twenty-three years. But one need not go out of Dr. Syme's own writings to find a case precisely parallel where he himself adopts the practice he so strongly condemns in the extract above quoted. He employs the name *Orchis purpurea*, Huds.,* for the plant subsequently called *O. fusca*, by Jacquin. This name was given by Hudson in his *first* "Flora Anglica" (1762), p. 334; in his *second* (1778) he dropped it, and the plant became *O. militaris*, var. *β*. (p. 384). To use *O. purpurea*, Huds., then is clearly, on Dr. Syme's own showing, an example of "raking-up an obsolete name,"which he thinks "always highly objectionable." It will, however, doubtless be considered by most "publishing botanists" that it would be far more objectionable to be hampered by any such regulations as those which Dr. Syme seeks to impose. The case of the names *Bromus ramosus*, Huds., and *B. asper*, Murr., is another of the same kind; here the author of the "Manual" maintains the established nomenclature, though here, as much as in *Aira setacea*, Hudson's name has a distinct right to be adopted instead. Nothing is said of *B. Benekeni*, Lange ("true B. asper"), having been found in England, though its characters, taken from our pages, are given. In the vascular Cryptogams there are a good many changes in nomenclature, e.g., *Equisetum umbrosum*, Willd., becomes *E. pratense*, Ehrh., and *Lycopodium selaginoides*, L., *Selaginella spinulosa*, A.Br.; the *Charæ* have also undergone a thorough revision.

Our limits will not permit of further remarks. It must be sufficient to say, in conclusion, that the last edition of the "Manual" is the best; though perhaps it shows the author to have been more a student of botanical literature than a worker in the field since the date of the former one. With so many descriptive Floras, each with special excellences of its own, English students of our native plants ought to find few difficulties indeed. H. T.

Flora of Dorsetshire: or, a Catalogue of Plants found in the County of Dorset. With sketches of its Geology and Physical Geography. By JOHN CLAVELL MANSEL-PLEYDELL, B.A., &c. London, Whittaker & Co.; Blandford: W. Shipp. 1874. (Pp. 323, with a map showing the districts adopted.)

We have here a welcome addition to the series of local Floras in a volume devoted to the plants of one of the least known of the southern counties, written by a botanist living in a central position in the district, and with the time and the means at his command for extensive personal investigation. It is scarcely necessary to remind our readers that Mr. Mansel-Pleydell in his explorations in search of Dorset plants has been rewarded by the discovery of *Leucoium vernum*, new to Britain, and of *Scirpus parvulus*, long lost to our flora; and the pages of the present volume show how diligently he has searched out the localities of many other rarities.

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* Syme. Eng. Bot., vol. ix., p. 93.

Dorset has an area of 988 square miles, an extensive and varied coast line on the English Channel, and great diversity of surface—geology and soil. From the Rhætic beds and the Lias up to the most recent superficial gravels, nearly all the formations are fully represented in the county, and clays, limestone, chalk downs and extensive gravelly heathlands, present themselves in different parts, the latter forming a marked feature of the south-eastern portion of the county. A very full account of the geology is given, which would, however, have been of greater interest to the majority of English botanists if the space devoted to palæontological matters had been given to some account of the influence of the various formations on the existing flora, a subject which is not alluded to. It would also have been well to show the geology on the map. With the exception of the south coast, the boundaries of Dorset are quite artificial, Devon, Somerset, Wilts and Hampshire being the adjacent counties.* The highest elevation is but 914 feet.

The author has divided the county into seven districts, the boundaries of which are shown in the map inserted in the volume. The river-drainage is taken as the foundation for these divisions, but has not been used with complete consistency. With the exception of a small part in the north-west drained by the Yeo, the water of which ultimately reaches the Bristol Channel, all the streams flow into the English Channel, about half the county lying in the basin of the Stour, which enters the sea at Christchurch, in Hants, and the great proportion of the remainder being drained by rivers and streams, of which the Frome and the Piddle are the two largest, which flow into the extensive estuary of Poole Harbour. No doubt the author has good reasons for the mode in which he has divided this portion of the county; it is, however, not easy to understand why the so-called Isle of Purbeck should be made a separate district, or in what district Poole and the country immediately round it are really intended to be included, nor does the text make the matter any clearer.

The large number of 989 species of Flowering Plants and Ferns (the other Cryptogams are not included) are enumerated as inhabitants of Dorset, the nomenclature of the "London Catalogue" being followed. Of these 68 are considered aliens, and 26 thought to be probably extinct. The author has certainly not erred on the side of swelling the number by the insertion of foreign plants; on the contrary he has omitted all reference to some which were worthy of notice, and might reasonably be expected to be included. *Berteroa incana*, discovered by Pulteney at Weymouth, in 1766, *Trifolium resupinatum*, first observed near Poole, and *Phalaris paradoxa*, which still holds its ground in the cornfields and roadsides near Swanage, where it was first noticed by Mr. Hussey in 1847 (all since found in other places) are examples. The author professes to have entered all the plants which have been recorded for the county by competent authority, and several unquestioned exotics such as *Mimulus luteus*, *Delphinium Ajacis*, and *Phalaris canariensis* find a place.

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* The boundary between Hants and Dorset seems to be ill-defined. That given in the map, if correct, enlarges Hampshire and makes the locality for *Simethis* in that county instead of in Dorset.

Under each species we have references to Mr. Watson's recent publications, to Syme's "English Botany," and to those authors who have previously recorded the plant for the county; the localities are arranged under their respective districts, and the last line is occupied by the distribution through the four adjacent counties and Normandy, a useful feature of the Flora. In addition the ante-Linnean synonyms are usually given, the utility of which is not very apparent except in the cases, which must be very few, where the old authors have recorded the plant as a native of Dorset. And in this connection we cannot but feel it necessary to remark that good as this Flora is in many respects it wants a more distinctly *local* character. This is a common fault in county Floras, and has already been commented on in these pages. In the volume before us we have a chapter headed "meteorology" in which there is not a word about the climate of Dorset! And in the portion headed "Botany" a very brief outline of the history of the science *generally* is given—which is necessarily of very slight value, and is out of place in a local treatise—instead of an account of the botanists who have specially elucidated the county flora, or were otherwise locally connected. Even in the list of books quoted we find a number of general botanical works, whilst Pulteney's Botany of Dorset is omitted. So, too, in the body of the work, one feels the almost complete absence of any information about the more interesting species beyond the fact of their growth in a particular spot. For instance, the three localities (to which may be added a fourth, Arne Heath), in district G must surely present some common special feature accounting for the abundant growth of the excessively scarce *Erica ciliaris*, which appears again in Cornwall, but skips Devonshire; and it would be quite within the province of a local Flora to give some information on this and similar points. Again, the bare locality for *Suæda fruticosa*, quoted from Pulteney, seems very insufficient to anyone who has seen the hedge of dense bushes formed by this rare species along high-water mark at the place in question; and who could tell from "Poole Harbour, Mr. W. Borrer," which is the whole local information about *Zostera nana*, that the plant thickly carpets many square miles of mud in that shallow estuary, and at low-water justifies its name of sea-grass? It is easy for the resident botanist to note facts of this sort, and they are often worthy of permanent record.

A few points may be noted in a cursory survey of the Flora. Three localities are given for *Cerastium pumilum*, Curt., which is also stated to grow in all the surrounding counties. Is this Boswell Syme's plant? *Lavatera arborea* is said to be probably extinct in a wild state on the Chesil Bank, though still growing in gardens in the neighbourhood, where it was introduced. *Sonchus palustris* was almost certainly an error; large *S. arvensis* has been often thus misnamed. *Atriplex erecta* is not at all likely to be "very rare" in Dorsetshire cornfields. There is a specimen of *Rumex maritimus* in Herb. Pulteney, not localised, which may be from Dorset. *Gladiolus illyricus*, Ensbury, where the author thinks it indigenous: this plant is too showy to have been overlooked; is it spreading? *Lemna gibba* will probably be found in the county. On the great heathlands *Juncus acutiflorus*, with well-marked characters, is universal to the exclusion of *J. lamprocarpus*; the latter is therefore not "generally distributed." *Vicia lutea* still grows at Weymouth, but *V. lævigata* has long been extinct, or at any rate has not been observed. The author quotes the "Botanist's Guide" only; more definite localities are given in Pulteney's and the Banksian Herbaria, which both contain numerous examples of this lost species or variety, which has never been met with elsewhere. A vigorous search ought to be made by the Dorset botanists to rediscover the plant.

In recommending the Dorset Flora to English botanists and collectors one feels sure that they will possess in it a concise and trustworthy guide to the plants of the county, carefully compiled by a competent botanist, who has personally gone over the greater part of the ground. One regrets to see a rather large number of misprints, but they are not generally of a very serious character, and detract but little from a book for which our thanks are due to the author, who has thus well filled up a gap in the county Floras. H. T.

Botanical News.

ARTICLES IN JOURNALS.—MAY.

Grevillea.—M. C. Cooke, "British Fungi" (contd. Tab. 22).—W. Archer, "On the 'Ague Plant'" (*Hydrogastrum granulatum*).—E. M. Holmes, "On *Tortula brevirostris*, Hook. & Grev."—Id., "On *Callithamnion hormocarpum*."—W. A. Leighton, "On *Lecidea Dilleniana*, Ach., and *Opegrapha grumulosa*, Duf. (tab. 26).—G. Davies, "Cryptogams from Piedmont and Nice."

Bot. Zeitung.—H. Hoffmann, "On the Garden Bean, *Phaseolus vulgaris*" (tab. 5).—M. Sorokin, "On some new Water-Fungi" (tab. 6).—T. Geyler, "*Exobasidium Lauri*, the cause of the aërial roots of *Laurus canariensis*, L." (tab. 7).—H. Solms-Laubach, "On the structure of the seeds in *Rafflesiaceæ* and *Hydnoraceæ*" (tab. 8).

Flora.—H. Christ, "*Rosa*—forms in Switzerland and neighbouring countries."—Celakovsky, "On the morphological significance of Seed-Buds" (contd.).—A. Ernst, "Observationes aliquot in plantas floræ Caracasanæ" (6 new species).

Oesterr. Bot. Zeitschr.—R. v. Uechtritz, "Botanical Notes, chiefly in S. Spain" (*Eruca longirostris*, n.s.).—L. Celakovsky, "*Hypericum transsilvanicum*, n.s."—J. Pantocsek, "Botanical Notes."—J. E. Hibsch, "On flora of Vienna."—A. Hoerne, "Species of *Scleranthus*" (77).—A. Kerner, "Hungarian Plants" (contd.).—J. Dedecek, "On flora of S. Bohemia."—H. Kemp, "On flora of neighbourhood of Vorarlberg" (contd.).

Botaniska Notiser.—F. W. C. Areschoug, "On Anatomy of Leaves" (contd).

Nuovo Giorn. Bot. Ital.—G. Archangeli, "On the Fungi of Leghorn."—Id., "On some Algæ of the group *Celoblasteæ*" (tab. 2, 3, 4).—N. Sorokine, "Note on the Development of *Hormidium varium* (tab. 5).—O. Beccari, "Description of a new species of *Myrmeco dia* (*M. Selebica*, Becc., tab. 6).

Bull. Bot. Soc. Belgique (v. xii., n. 3. May 30th).—"Account of Excursion to Hasselt, &c., in July, 1873.—J. E. Bommer, "On Amylogenesis in Plants."—C. Dumortier, "Two Physiological Facts."—T. Durand and H. Donckier, "Materials for Flora of prov. Liége."—C. Baguet, "Winter Flowering, Jan. 1873."—C. H. Delogne, "Contributions to Belgian Cryptogamic Flora."

Bull. Bot. Soc. France (v. xxi., p. 1).—O. Debeaux, "New Rose from E. Pyrenees" (*R. Gandogeriana*).—B. Balansa, "Catalogue of *Gramineæ* of Lazistan" (4 new species).—A. Fée, "Material for Lichenological Flora of Brazil; II." (Many new species.).—C. Roumeguere, "On Colour of Fungi spores as an indication of Properties."—Id., "Anomalous forms of *Osmunda*."—P. Petit, "On *Spirogyra* and *Rhynchonema*" (*S. punctata*, n.s. tab. 1.).—Id., "Contrib. to Cryptogamic Flora of Paris."—Miègeville, "On a *Trisetum* from Hautes-Pyrenées" (*T. varegense*, Lafitte & Miègeville).—E. Lefranc, "On the *Helminthochorton* and Corsican Moss of the Ancients."—Id., "On *Roccella* and *Rhytiphlœa*, and the Tyrian Purple."—E. Cosson, "On M. Doumet-Adamson's intended voyage to Tunis."—A. Chatin, "Comparative study of the Andrœcium."—M. Cornu, "Fertilization in Algæ, especially in *Ulothrix*."—P. Sagot, "Germination of seeds sown before maturity."—E. Heckel, "On the Functional Irritability of the Stamens in *Berberis*."—Id., "Differences between Induced and Spontaneous movement; action of Anæsthetics on stamens of *Mahonia*."—J. E. Planchon, "Wild Vines of United States."—J. Duval-Jouve, "Histological study of the species of *Cyperus* in France."—M. Lamotte, "New Plants in Auvergne" (*Dianthus Girandini*, *Hypericum Desetangsii*, *Taraxacum salsugineum*).

New Books.—P. Parlatore, "Les Collections botaniques du Musée Royal de physique et d'histoire naturelle de Florence" (Florence.)—T. Crépin, "Manuel de la Flore de Belgique," 3rd edition (Brussels, 6 fr.).—Schulzer and Kalchbrenner, "Icones Hymenomycetum Hungariæ," pt. 2 (Pesth. 12 shillings).—Baillon, "History of Plants," vol. iii. of the English Translation (Reeve, £1. 5s.).—V. B. Wittrock, "Prodromus Monographiæ Œdogoniacearum" (from Acta Upsal., ser. 3, vol ix.).—Sereno Watson, "Revision of N. American *Chenopodiaceæ*" (from Proc. Am. Acad. ix., pp. 82—126).

Antoine Laurent Appollinaire Fée, the well-known pteridologist, for many years professor of botany at Strasburg, died at Paris on the 21st of May in the eighty-fifth year of his age. He was born on Nov. 7, 1789, graduated at Strasburg, served as a doctor in the French army during the Peninsular war, of which he published "Souvenirs" in 1809—13, and after settling for some time as a druggist in Paris, again entered the public service. He filled first an appointment at Lille, removing in 1832 to Strasburg, where he remained till the city passed into the hands of the Germans. Then he removed to Geneva, and soon afterwards came back to Paris, where at the time of his death he was President of the French Botanical Society. His Memoirs on Ferns are thirteen in number, beginning with 1844 and extending over more than a quarter of a century. They are: "Examen des bases adoptées dans la classification des Fougères, et en particulier de la nervation," 2 plates, 1844; 2, "Histoire des Acrostichées," a most elaborate work in folio, 64 plates, 1844-45; 3, "Histoire des Vittariées et des Pleurogrammées," and 4, "Histoire des Antrophyées," on the same plan as the Acrosticheæ, 5 plates; 5, "Genera Filicum: Exposition des Genres de la famille des Polypodiacées," 30 plates, 1850-52; 6, "Iconographie des espèces nouvelles, décrites ou énumérées dans le Genera Filicum," an illustrated adjunct to the preceding; 7, "Iconographie (suite)," and 8, "Description d'espèces nouvelles et Annotations relatives aux précédents Mémoires," 27 plates, 1854-57; 9, "Catalogue Méthodique des Fougères et des Lycopodiacées du Mexique," lithographed, 1857; 10, "Iconographie des espèces nouvelles, décrites ou énumérées dans le Genera Filicum, et révision des publications antérieures relatives à la famille des Fougères," 17 plates, 1865; 11, "Histoire des Fougères et des Lycopodiacées des Antilles, 34 plates, 1867; 12, "Cryptogames Vasculaires du Brésil, 1869, 78 plates and a supplement, 1872-3,30 plates. The great value of his Fern Books is in the plates, which from the beginning of the series to the end are excellent, both scientifically and artistically, and are accompanied with full microscopic details. His system of Fern-classification and generic limitation is, in general outline, the same as that of Presl, and this the thirty plates of his fifth memoir illustrate fully and clearly. The drawback to the use of his books lies in the readiness with which he has described and named new species without comparing his specimens with the types of his predecessors. Out of Glaziou's Brazilian gatherings alone he has named not less than 200 new species, so-called, which Mr. Baker regards as synonyms or slight individual variations. His herbarium has gone to Rio, and it is impossible without it to settle where many of the plants described, but not figured in his earlier memoirs, should be placed. It is very desirable that it should be compared throughout by some competent authority with a collection in which the types of other species-names are authentically represented. Besides his works on Ferns, Prof. Fée has been an author on other families of Cryptogams; a "Méthode Lichenographique," in 1825; an essay on the Cryptogams on foreign officinal barks, in two parts, in 1824 and 1837; and many shorter papers having been published by him. His "Cours d'Histoire Naturelle Thérapeutique," appeared in 1828, and a life of Linné in 1829. Besides his scientific tendencies he possessed also a strong literary taste, which resulted in numerous works on general topics, essays, bibliography, poetry, &c.; one of his last books has the title, "Les Misères des Animaux," 1862. Both his tastes were gratified in his notes on the determination of the plants of Pliny, Virgil, and Theocritus in Panckoucke's translations of those authors.

Among the recipients of the honorary degree of LL.D. recently bestowed at Cambridge we see with pleasure the name of Mr. Bentham.

Original Articles.

ON THE OCCURRENCE OF *DICRANUM FLAGELLARE*, *Hedw.*, IN BRITAIN.

By E. M. Holmes.

[Tab. 149.]

This species is very nearly allied to *Dicranum Scottianum*, which, in the dry state, it closely resembles in appearance; hence these two mosses have often been confounded. It was first described by Hedwig, who gives an excellent figure of the plant in his Musc. Frond., vol. ii., t. i., fig. 1. The first record of its occurrence as a British moss is by Dickson, in 1793, under the name of *Bryum flagellare*, in his Plant. Crypt. Brit., fasc. iii., p. 6, where he states that he found the moss on rocks on Ben Nevis, and quotes Hedwig's figure. Unfortunately I have not been able to meet with specimens collected by Dickson, but it is probable that they would prove to belong to *D. Scottianum*, as *D. flagellare* occurs almost exclusively on decaying stumps of tree, and never, so far as I have been able to learn, on rocks. In 1804, it was described in Turner's Musc. Hibern. (p. 71) as occurring in Ireland on rocks, but no locality was given. In the same year it was published in the Flor. Brit., vol. iii., p. 1206, by Smith, as a British species, Dickson's locality being quoted with the additional one of Cromford Moor, near Matlock, where the author states that he found it, but the Irish locality is not mentioned, hence it is probable that at that time Smith had not seen Irish specimens. In 1809, it was figured in E. B., t. 1977, the drawing of fruiting specimens being taken from Irish plants, which were sent to Sir. J. E. Smith, by Dawson Turner, and were collected at Lough Bray. The two figures of barren stems in the centre of the plate appear to have been taken from the Cromford Moor specimens, since figures of the barren stems do not occur in the original drawing made from Dawson Turner's Irish specimens. These drawings, as well as Turner's original specimens from Lough Bray are in the British Museum, and I have been permitted to examine the Irish specimens and to determine that they must be referred to *Dicranum Scottianum*, Turn. In the Bryologia Britannica, Wilson refers the left-hand figure of E. B. t. 1977 to *D. Scottianum*, and states that the reputed variety of *D. flagellare*, growing on Cromford Moor, is a tall state of *Campylopus flexuosus*. Hence, unless Dickson's plant, of which Wilson takes no notice, was really *D. flagellare*, that species cannot be considered to have been hitherto discovered in Britain.

The specimens from which the present figures are taken were found in Abbey and Bostol Woods in N. Kent, and were growing on the decaying stumps of *Castanea vesca*, which is very abundant in that locality. In the same wood, but generally on taller and less decayed stumps, *Dicranum montanum* also occurs, and is readily distinguished in the dry state from *D. flagellare* by being as much crisped as *Weissia cirrhata*.

The following description of *D. flagellare* is taken from English specimens:—*Stems* ½ to 1 inch high, slightly branched in a forked manner, and matted together by reddish fibres into extensive tufts. *Leaves* yellowish or full green, spreading and slightly arched, forming a tuft at the apex of the branches after the manner of *D. scoparium*. In those specimens which bear *flagellæ* the leaves are nearly erect and straight, and the tufts are more compact and fastigiately branched. All the leaves have the margins connivent from near the base, so that one half of the lamina is folded over the other, the leaf thus presenting a tubular and subulate appearance. Apex minutely serrulate, with about three tolerably distinct teeth on each side; the back of the nerve near the apex is also minutely serrulate. The nerve sometimes appears to vanish just below the apex of the leaf, but is often prolonged to its apex. In the lower half of the leaf the lamina is about 2½ times as broad as the nerve, and consists of oblong cells, which have rounded or sometimes oblique ends. The cells become quadrate above, and only half the size of the oblong cells in the lower part of the leaf. The alar cells are large and quadrate, brown if the leaf has been taken from a comal tuft, and form a distinct patch extending to the nerve. There are generally eight rows of these cells, the two rows nearest the margin of the leaf on either side having narrower cells than the rest. In the young leaves the alar cells are scarcely coloured, and pass gradually into the oblong cells. The nerve is rather flattened and appears to gradually blend with the lamina on account of having next to it on either side throughout its length one or two rows of very narrow cells.

The fruit has not yet been found in Britain, therefore the following descriptions and figures of it are taken from Hedwig's and Bruch and Schimper's works.

Male flowers—Arranged in terminal heads among the uppermost leaves; the perichætial leaves ovate-lanceolate, containing antheridia mixed with paraphyses, which have the cell at the apex obtuse. *Female flowers*—Terminating the stems and adult innovations; the two outer perigonial leaves short, obtuse, and nerveless, the two inner convolute and apiculate, furnished with a slender nerve, the inmost leaf resembling the two outer ones. Archegonia without paraphyses. *Capsule*—Erect and reddish when mature. Operculum pale yellowish green with a reddish base, incurved, and ending in a long subula. Annulus none. Peristome of sixteen teeth, deeply cloven, the teeth unequal in length, pale but reddish at the base.

The above description is from Hedwig; that of Bruch and Schimper somewhat differs as follows:—Capsule striate, remotely furrowed when dry, and sometimes curved. Annulus very narrow. Male plants mixed with the female ones.

The stems of *D. flagellare* often give off slender flagellæ from the axils of the leaves. The leaves of these shoots are minute, lanceolate, obtuse, entire, and have a scarcely perceptible nerve when very young.

These flagellæ are said by Bruch and Schimper to appear during the period of inflorescence and to fall during the formation of the fruit, to be not always present, nor equally numerous in all tufts.

From the nearly allied *D. montanum* and *D. Scottianum* our plant may be thus distinguished. *D. montanum* has more slender stems, the leaves are narrower, *distinctly curled when dry*, so as to resemble a *Weissia* rather than a *Dicranum*, strongly serrate at the apex and back of the nerve, and *serrulate almost to the base of the leaf*, the back of the leaf is distinctly papillose, the margin straight and erect, not incurved, so that the leaf does not form a subulate tube. The alar cells consist of five rows with generally only one row of narrower cells at the margin of the leaf. The width of the lamina at the base of the leaf is from one and a half to twice that of the nerve.

D. Scottianum may be distinguished in the dry state by the erect leaves which *do not form comal tufts*, but are densely imbricated throughout the whole length of the stem. The leaves are longer, more tapering, have often an excurrent nerve, and are *never perceptibly serrate*, the margins are not connivent but readily flatten out under the microscope, the *cells have thicker walls, and are narrower* than in *D. flagellare*, the *alar cells do not extend to the nerve*, but consist of about six rows of enlarged quadrate cells, with from three to five rows of narrower cells intervening between them and the nerve. The nerve is narrower and thicker than in *D. flagellare*. The habitat is also different, *D. Scottianum* growing in well-defined, rounded tufts on rocks., while *D. flagellare* grows in irregular spreading patches, on decaying stumps of trees.

DESCRIPTION OF TAB. 149.

Figs. 1-10 *Dicranum flagellare*, Hedw., 1, a tuft showing appearance when dry; 2, the same when moistened; 3, a denser tuft with flagellæ; 4, a leaf from comal tuft × 38; 5, base, and 6, apex of leaf to show areolation × 63; 7, flagella × 63 (Figs. 1-7 from specimens collected by Mr. Holmes at Bostol Wood. Kent, Feb., 1874); 8, fruiting stem, after Hedwig; 9 and 10, fruit magnified, after Bruch and Schimper.

Figs. 11-17 *D. Scottianum*, Turn.—11, perfect leaf × 38; 12, leaf from upper part of stem × 38; 13, base, and 14, apex of leaf to show areolation × 63; 15, outer perichætial leaf; 16, inner perichætial leaf enclosing antheridia and paraphyses; 17, an antheridium separated; all × 63. (Figs. 12, 13, 15, 16 and 17, from specimens collected at Lough Bray, Ireland, by Dawson Turner; Figs. 11 and 14, from Sussex specimens, the leaves of the Irish plant being so discoloured by peat water as to render them indistinct)

EUPHORBIACEÆ NOVÆ

A CL. DR. LORENTZ IN REPUBLICA ARGENTINENSI LECTÆ ET A CL. PROF. DR. EICHLER COMMUNICATÆ,

auctore J. MULLER, ARG., CUST. HB. DC.

(*Concluded from page* 20~~5~~.)

7. JULOCROTON SERRATUS *Müll. Arg.*, caule humili superne compresso-anguloso, stipulis elongatis setaceis indivisis, petiolis evolutis limbo demum vix brevioribus, limbo longe palmatinervio argute

serrato utraque facie indumento densius pannoso valde compacto molli albicante vestito, racemis capitiformibus, bracteis linearibus elongatis 1-floris, calycis fem. laciniis 3 evolutis ambitu ovatis pinnatipartitis reliquis 2 exiguis lanceolatis, illarum lacinulis 4-5 linearibus patentibus diametro rhacheos lanceolatæ duplo longioribus, petalis masc. lineari-spathulatis undique pubescentibus femineis obsoletis, disco hypogyno hinc profunde 3-partito, glandulis elongato-ovatis fere omnino adnatis glabris, staminibus 11, filamentis hirto-pubescentibus, antheris 2½-plo longioribus quam latis, ovario tomentoso, stylis inferne connatis bis bifidis ovario oblique insertis, seminibus dorso lævibus latere ventrali ruguloso-asperis.

Suffruticulus circiter semipedalis vel paulo altior. Caudex pollicis v. digiti crassitie, torulosus, lignosus, apice subinde divisus et in caules simplices erectos nonnihil flexuosos et numerosos abiens. Caules basi teretes et glabrati, cæterum compresso-angulosi, plus minusve sulcati, inferne parcius, superne densiuscule foliosi et indumento patente hispidulo et simul breviore tomentello vestiti, denudati basi diametro 2 mm. æquantes; indumentum patens 1½ mm. longum. Petioli 1-2½ cm. longi, limbum subinde bene æquantes, sæpius tamen, præsertim in parte superiore caulium limbo circ. triente v. dimidio breviores, tomentelli et simul hispido-pubescentes. Limbus foliorum 1½-3½ cm. longus, æquilatus ac longus, ambitu rhombeo-orbicularis v. rarius late ovatus, brevissime acutatus, basi nonnihil angustata obtusus v. subinde leviter cordatus, basin versus integer, cæterum argute serratus, sinus dentium subinde eroso-obtusi. Pagina superior virescenti-albida, inferior primum alba, dein cinerascens, densissime vestita et limbus indumenti copia modice incrassatus. Inflorescentiæ ut in *J. subpannoso*, sed flores masc. paulo majores, antheræ demum magis exsertæ, (connectiva ut in illo puberula), et discus hypogynus omnino glaber glandulæque ipsæ magis oblongatæ. Capsulæ 5 mm. longæ. Semina 4 mm. longa, similia iis *C. subpannosi* sed dorso lævia.

A simili sed elato *J. subpannoso* recedit petiolis, forma et serratura limbi foliorum et disco hypogyno glabro. A *C. montevidensi* præter alia differt seminibus non undique lævibus. Planta tota longe gracilior quam *J. humilis* et indumentum partium aliud et folia aliter petiolata.

Habitat in quadam Barranca prope Cordoba in Republ. Argentina: Lorentz n. 292, *in hb. Eichl. et in hb. DC.*

8. **Acalypha Cordovensis** *Müll. Arg.*, stipulis setaceis longiusculis, petiolis limbo subtriplo brevioribus gracilibus, limbo tripli-quintuplinervio membranaceo serrato, indumento simplici, spicis masc. axillaribus mediocriter pedunculatis densifloris latiusculis subinde basi floribus fem. auctis, femineis terminalibus gracilibus densifloris, bracteis fem. 1-floris usque ad medium 13-17-fidis laciniis lanceolato-linearibus obtusis apicem versus vix angustatis scabris, ovario parce papilloso non muricato hirtello, stylis dorso papilloso-spinulosis laciniis 5-7 integris et hinc inde bilobis brevibus, seminibus mediocribus lævibus.

Planta perennis, basi lignescens, cæterum herbacea, primo intuitu formam gracilem angustifoliam *Acalyphæ communis v. hirtæ* referens. Caules circ. pedales, erecti, subrecti, simplices, tota longitudine foliosi et in axillis fere omnibus foliorum spicas masculas proferentes pallide virides cum petiolis indumento albido patenter hispido-pubescentes. Stipulæ circ. 3½-4 mm. longæ, angustissimæ, paucipilosæ. Petioli circ. 8-10 mm. longi. Limbus foliorum 2½-3½ cm. longus, 12-17 mm. latus, oblongo-v. lanceolato-ovatus, acutus, basi obtusus, v. inferiorum obtusior et ambitu latior vulgoque dimidio et ultra brevior, omnium argute dentatus, obscure argillaceo-viridis, novellorum parce adpresso-pubescens, evolutorum fere omnino glabratus. Costæ secundariæ infimæ longe ultra medium limbi productæ. Pedunculi spicarum masc. circ. longitudine petiolorum v. iis breviores, crispule pubescentes. Spicæ masc. ipsæ florendi tempore 2-3 cm. longæ, 3 mm. latæ, i.e., latiores et breviores quam in *A. communi*, defloratæ 4 cm. attingentes, femineæ circ. 4-4½ cm. longæ. Bracteæ fem. laxe subimbricatæ, non omnino discretæ, fructigeræ 3-3½ mm. longæ, præsertim ad lacinias papilloso-asperæ. Calyx masc. tetragonus, aperiens ⅘ mm. latus, parce et breviter piligerus, v. subglaber; laciniæ dorso apice et sub apice papilloso-scabræ. Calycis fem. laciniæ lanceolato-ovatæ, acuminatæ. Filamenta loculis antherarum paullo breviora. Capsulæ 2½ mm. longæ, trigastricæ, hirtellæ, olivaceo-virides. Semnia fere 2 mm. longa ut in *A. communi*.

A proxima *A communi* var. *hirta* differt ambitu foliorum, spicis masc. multo latioribus et brevioribus, floribus masc. multo minus exiguis, bracteis femineis et stylis.

Habitat abundanter in campo et in Barrancis prope Cordoba in Republ. Argentina: Lorentz, n. 317, *in hb. Eichl. et in hb. DC.*

9. Bernardia Lorentzii *Müll. Arg.*, caule suffruticoso validiusculo, ramulis retrorsum, pedunculis antrorsum pubescentibus, stipulis anguste triangularibus parvis, foliis subsessilibus subtus basi valide maculari-biglandulosis rigidis, costis obliquis, pedunculis spicas masc. longitudine superantibus, staminibus 5-7, disco hypogyno nano trilobo membranaceo integro, ovario adpresso-sericeo-pubescente, seminibus trigonis dorso acute carinatis lateribus obsolete plicato-asperis.

Planta indurato-herbacea, basi lignescens. Caules ex apice multicipite radicis numerosi, circ. pedales v. paulo altiores, simplices v. superne parce aut spurie di-trichotome ramosi, spartioideo-rigiduli, teretes, glauci, viridi-striati, usque ad apicem latiusculi, præsertim circiter media altitudine distincte incrassati et ibidem crassiores quam ipsa basi. Stipulæ petiolis breviores, rigidulæ. Petioli brevissimi, sæpius 1-1½ mm. lati, subduplo crassiores quam longi. Limbus foliorum infimorum minor, obovatus v. oblongo-obovatus, subinteger, mediorum 4-6 cm. longus, 1¾-2¼ cm. latus, lanceolato-obovatus v. etiam elliptico- v. ovato-lanceolatus, obtuse acuminatus, serrato-dentatus, subcoriaceus, pallidus, pilis valde adpressis adspersus et costis pallidioribus prominentibus percursus; costæ secundariæ utrinque 5-6, infimæ usque ad limbum dimidium productæ, omnes obliquæ; limbus foliorum summorum iterum minor sæpeque obtusior sed eodem modo dentatus. Pedunculi spicarum masc. axillarium circ. 11-17 mm. longi, graciles, spicæ ipsæ 7-9 mm. longæ; bracteæ subconfertæ, in quaque spica circ. 4-7, sæpius circ. 8-12-floræ. Pedicelli masc. longius supra medium articulati, tenelli. Flores masc. aperientes ¾-⅘ mm. lati et totidem longi, subtrigoni, pilis adpressis perexiguis et paucis inferne præsertim adspersi. Glandulæ receptaculi masculi perexiguæ. Flores fem. in apice caulium et ramulorum vel in ditrichotomiis pauci, conferti. Laciniæ calycis ambitu latæ obtusæ, rigide ciliolatæ. Styli in ovario subtricornuto distincti, segregati, nani, bilobi. Capsulæ 5½ mm. longæ, 7 mm. latæ, in dorso carpidiorum obtuse carinatæ et in ipsis carinis superne sulcatæ, pilis eximie adpressis brevibus rigidulis cinerascentes. Semina griseo-nigricantia, opaca.

A proxima *B. caperoniæfolia* Baill. differt habitu rigido, consistentia et forma foliorum, spicis masc. longius pedunculatis, disco hypogyno, et ramulis retrorsum nec antrorsum adpresso-vestitis.

Habitat in quadam Barranca prope Cordoba in Republ. Argentina: Lorentz, no. 296, *in hb. Eichl. et in hb. DC.*

10. **Manihot anisophylla** *Müll. Arg.*, foliis longe petiolatis profunde 3-5-partitis epeltatis, laciniis aliorum obovatis indivisis aliorum ambitu ellipticis et panduriformibus lobis utrinque sinu lato inter se segregatis, omnium membranaceis, stipulis setaceis longiusculis deciduis, racemis mediocribus, bracteis setaceo-linearibus pedicellos masc. dimidios æquantibus integris deciduis, calyce masc. pro ⅔ longitudinis 5-fido extus intusque undique glabro membranaceo, filamentis et disco glabris, antheris 3-plo longioribus quam latis, ovario glabro exalato, seminibus compressis margine utrinque carinatis.

Frutex altitudinem humanam dimidiam æquans, patenter ramosus, ramis ultimis herbaceis, omnibus partibus glaberrimus, basi supra radicem haud raro bulboso-incrassatus. Rami subcompressi, cum foliis subolivaceo-virides, nonnihil flexuosi v. curvati; internodia petiolis subæquilonga. Stipulæ 4-6 mm. longæ, debiles. Petioli limbum æquantes v. subæquantes, basi distincte articulati. Limbus foliorum 7-11 cm. longus, 10-16 cm. latus, basi cordatus; costæ tenues, parenchymati subconcolores, venæ tenuissimæ. Laciniæ indivisæ abrupte et acutissime subsetaceo-acuminatæ, costis utrinque circ. 9-10 angulo semirecto insidentibus rectis subparallelis præditæ; foliorum inferiorum laciniæ intermediæ 1-3 panduriformes, infimæ subindivisæ v. latere exteriore tantum prope basin minute 1-lobatæ, intermediæ quasi hinc e basi late obovata 4-4½ cm. lata, et illinc apice late rhombeo-ovato, isthmo 1-2 cm. lato et 5-15 mm. longo cum basi conjuncto formatæ sunt. Bracteæ 4 mm. longæ (duæ visæ). Calyx masc. (duo visi) 1 cm. longus, aperiens obovoideus; lobi late triangulari-ovati, acuti. Discus florum masc. parvus. Antheræ 2⅔ mm. longæ. Calyx fem. ignotus. Capsulæ maturæ 18 mm. longæ, globosæ, in dorso carpidiorum leviter carinatæ. Semina absque caruncula ampla 9-11 mm. longa, fere totidem lata, sed tantum 5 mm. crassa, ambitu ellipsoidea, fuscescenti-cinera, striis atris irregularibus subrectis paucis ornata.

Affinis *M. Janiphoidi* sed bene distincta.

Habitat inter saxa valleculæ cujusdam prope Ascochingam in Republ. Argentina: Lorentz, no. 297, *in hb. Eichl. et in hb. DC.*

11. **Sebastiania Klotzschiana**, *var.* **trichopoda**, *Müll. Arg.*, ramulis ultimis et penultimis brevibus, ultimis brevissime puberulis, petiolis patenter puberulis, foliorum limbo oblongato-elliptico v. minorum latiuscule elliptico glabro pallido subtus subconcolore v. glauco-cinerascente.

Omnia ut in *Sebastiania Klotzschiana β brachyclada* sed petioli parce hirto-puberuli. Fructus bene conveniunt, flores tamen et semina hucusque ignota sunt. Frutex elatus v. arbor humilis.—Inter var. *brachycladam* et v. *trichoneuram* hujus speciei inserenda est.

Habitat in montibus versus Sierra anteriorem inter Andes et Cordoba sitam prope Calera: Lorentz, no. 373, *in hb. Eichl. et in hb. DC.*

12. Euphorbia serpens (*Kunth*) *var.* microphylla *Müll. Arg.*, caulibus e caudice tenuiter lignoso numerosissimis ramosissimis intricatis prostratis et radicantibus valde microphyllinis, foliis minimis, involucri glandulis violaceo-purpurascentibus, appendicibus glandulas latitudine superantibus albidis v. dilute violascenti-albidis integris v. repando subquadrilobatis.

Caules 3-13 cm. longi, tenuiter filiformes, densiuscule foliosi. Folia tantum 1½-2½ mm. longa et 1⅜-1⅞ mm. lata, i.e., minora quam in ipsa var. *radicante* Engelm., cæterum iis speciei omnino conformia. Planta, evidentissime perennis, quoad characteres specificos, stipulas, stylos, capsulas et semina perfecte cum planta Kunthiana quadrat.

Habitat ad vias etc. prope Cordovam in Republ. Argentina ubi vere et æstate frequens et herba infestans: Lorentz, no. 302, *in hb. Eichl. et in hb. DC.*

13. Euphorbia Lorentzii *Müll. Arg.*, caulibus herbaceis subprostratis, ramis suberectis, stipulis interpetiolaribus late triangulari ovatis liberis v. incomplete in unam connatis fimbriato-laceris, foliis breviter petiolatis ovatis basi obliqua semicordatis argute serrulatis membranaceis, involucris terminalibus et in dichotomiis supremis sitis solitariis pedicellatis, pedicello involucrum æquante vel eo paulo longiore, involucro turbinato-campanulato glabro intus fauce albido-hispido, lobis lanceolatis fimbriatis tubo 3-plo brevioribus, glandulis stipitatis gyalectiformi-urceolatis orbiculatis v. nonnihil transversim oblongatis extus appendice firma albida semielliptica integra v. repando-2-4-loba iis latiore cinctis, cicinnis cyathii ad florem unicum reductis, bracteis florum monandrorum lineari-lanceolatis superne plumoso-ciliatis indivisis, flore fem. validiuscule stipitato glabro calyce omnino destituto, stylis abbreviatis bifidis erectis, capsulis glabris tridymis in dorso carpidiorum rotundato vix distincte carinatis, seminibus tetragono-globoso-ovoideis lateribus transversim irregulariter rugulosis.

Caules diametro 1 mm. subæquantes, prostrati aut e basi procumbente adscendentes, quoad specimina visa haud radicantes nec arcte adpressi, inferne glabrati, cæterum cum ramis et ramulis et foliis pilis elongatis griseis patentibus villosuli; internodia inferiora 2-4 cm. longa; rami paulo graciliores et densius foliosi, pallide virides. Stipulæ paulo longiores quam longæ, hispidulæ. Folia caulium minus procumbentium 15 mm. longa, 7-8 mm. lata, oblique et obtuse acutata, subtus glaucescentia v. primum purpurascentia, creberrime venulosa, ramulorum quarta parte minora, floralia ambitu angustiora, 3-4-plo longiora quam lata, juniora nonnihil purpurascenti-viridia. Involucra evoluta ¾ mm. longa, primum anguste turbinata, dein magis campanulato-turbinata, extus lævia et glabra, purpurascentia, extus intusque præter faucem glabra. Glandulæ margine connivente excavatæ, fuscæ. Capsulæ 1½ mm. longæ. Semina 1¼ mm. longa, plumbeo-fuscescentia.—Affinis *E. ovalifoliæ*, sed haud integrifolia, nec glabra et stipulis omnino aliis prædita. Ab *E. serpyllifolia*, Pers., et ab *E. Engelmanni*, Boiss., jam stipulis differt et a simili *E. maculata*, L., capsulis glabris statim recedit.

Habitat locis humidis prope San Francisco in Republ. Argentina, ubi inter herbas prorepens crescit: Lorentz, no. 299, *in hb. Eichl. et DC.*

14. Euphorbia ovalifolia δ Argentina, *Müll. Arg.*, foliis obscure glaucescentibus, glandularum appendice angustissima v. obsoleta, calycis feminei laciniis subtriangularibus inciso-fissis.

Habitus ut in γ *Montevidensi*, calyx ut in β *schizosepala*, sed magis evolutus, et glandularum appendices nonnisi marginem perangustissimum paullo pallidiorem simulantes v. omnino indistinctæ, multo angustiores quam in ipsa γ *Montevidensi*. Caules 15 cm. longi, procumbentes. Petioli 1 mm. longi v. foliorum juniorum breviores. Foliorum limbus 3-5 mm. longus, 1½-2¾ mm. latus. Styli brevissimi. Capsulæ 1¾ mm. longæ. Semina ut in tota specie leviter tantum sed distincte faciebus rugulosa, in angulis ipsis autem lævia.

Habitat prope Ascochinga in Republ. Argentina: Lorentz, no. 300, *in hb. Eichl. et in hb. DC.*

15. Euphorbia Eichleri, *Müll. Arg.*, caulibus inferne lignescentibus suberectis alternatim ramosis, stipulis e basi late triangulari lanceolato-acuminatis profunde inciso-laceris basi geminatim breviter connatis, foliis lanceolato-ovatis acutis basi obliquis firme membranaceis parce denticulatis, involucris axillaribus et terminalibus solitariis, pedicello involucri glabro, involucro campanulato extus glabro intus fauce hirto, lobis triangularibus indivisis ciliatis, glandulis orbiculari-gyalectiformibus fuscis appendice iis sublatiore pallida lunata integerrima cinctis, cymulis v. cicinnis internis 1-2-floris, bracteolis internis flabellatim 5-fidis superne plumosis, pedicello fem. superne piloso, calyculo femineo annulari integro prominente, ovario undique adpresso-piloso, stylis longiusculis suberectis bifidis cruribus cylindricis obtusis, capsulis trigastricis pilosis in dorso carpidiorum non carinatis, seminibus tetragono-ovoideis faciebus irregulariter et leviuscule rugulosis.

Planta circ. 20-centimetralis, a basi ramosa, olivaceo-virens v. demum obscure viridis v. nigricans, omnibus partibus vegetativis, excepto pedicello involucrorum, pilis griseis v. obscurioribus, subpatentibus v. leviter crispulis vestita, indumentum tamen foliorum, præsertim paginæ inferioris, paulo longius. Caules basi diametro 2 mm. æquantes; internodia 1½-2½ cm. longa, ad insertionem foliorum nonnihil nodoso-incrassati; rami erecto-patentes. Stipulæ fere 1 mm. longæ, hispidulæ. Petioli 1½-2 mm. æquantes. Limbus foliorum 13-17 mm. longus, 4-7 mm. latus, basi altero latere semicordatus, altero obtusus, tota longitudine distanter denticulatus, foliorum ramulinorum triente v. dimidio minor, cæterum conformis, superiorum lanceolatus et fere integer, illi ramulorum axillarium subconferti. Pedicelli involucrorum crassiusculi, lævigati, involucra bene æquantes. Involucra 1 mm. longa, extus lævigata, fere æquilata ac longa. Capsulæ 2 mm. longæ. Semina 1½ mm. longa, sicca griseo-plumbea, madida fuscescenti-rubella.

Primo intuitu specimina depauperata pauciflora simulat *E. lasiocarpæ*, Kl. (Boiss. in DC. Prodr., vol. xv., 2, p. 23), sed dispositio florum alia et involucra et stipulæ longe differunt. A proxime affini

E. Meyeniana, Kl. (Boiss. in DC. Prodr. vol. xv., 2, p. 42), distinguitur caulibus suberectis, foliis nec obtusis nec grosse argute serratis, involucris extus glabris, appendicibus parvis glandularum et forma stylorum.—Species insigniter distincta.

Habitat prope Ascochinga in Republ. Argentina: Lorentz, no. 301, *a cl. Prof. Eichler benevole communicata, in hb. Eichl et in hb. DC.*

16. EUPHORBIA PORTULACOIDES, β OBTUSIFOLIA, *Müll. Arg.*, caulibus erectis cum foliis glabris, foliis caulinis oblongo- v. lanceolato-obovatis v. hinc inde oblongato-ellipticis rotundato-obtusis 1½-2 cm. longis circ. 6-11 mm. latis, floralibus late lanceolatis acutis v. subacutis, umbellæ radiis circ. 4-6 cm. longis.

Habitat vulgatissime "in campis et rivulis," prope Cordoba in Republ. Argentinensi: Lorentz, no. 303, *pr. p., sed eadem sub schedula etiam var. major aderat, in hb. Eichl. et in hb. DC.*

EUPHORBIA PORTULACOIDES, δ MAJOR, *Müll. Arg.*, caulibus suberectis circ. pedalibus cum foliis glabris, foliis caulinis spathulato-lanceolatis rotundato-obtusis circ. 3-4 cm. longis et 9-13 mm. latis, floralibus ovato-lanceolatis abrupte et obtuse subacutatis, costis 3 foliorum evolutorum bene distinctis tenuibus subtus prominulis, umbellæ radiis circ. decimetralibus.

Habitu elatiore et foliis distinctius trinerviis cum var. *trinervia*, Boiss. in DC. Prodr., vol xv., 2, p. 103, quadrat, sed habitu neutiquam *E. verrucosam* referens.—Fructus et semina utriusque varietatis ut in specie. Glandulæ atro-purpureæ. Involucri lobi rosei v. purpurascentes.

Habitat circa Cordoba in Republ. Argent., ubi frequentissima: Lorentz, no. 303, *pr.p, in hb. Eichl. et in hb. DC.*

Obs.—Species comparationis causa supra citatæ in Martii Flora Brasiliensi elaboratæ et nuperrime editæ sunt.

BOTANICAL BIBLIOGRAPHY OF THE BRITISH COUNTIES.

By HENRY TRIMEN, M.B., F.L.S.

(*Concluded from page* 183.)

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* For uniformity I have endeavoured to arrange the Scotch local Floras under the names of the counties. Many of them, however, relate to the more ancient divisions, as Moray, Clydesdale, Braemar, &c. (which are usually defined by natural boundaries, and therefore more suitable for scientific treatment), into which the country was formerly divided, and the names of which are still maintained.

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DUMFRIES.—[72. Pr. *W. Lowlands.*] Drained by Esk, Nith, and Annan into Solway Firth; N. boundary natural.

2.—New B.G., 414.

Dumfries.—P. Gray in Phyt., i., 416.—Hepaticæ, Cruikshank in Phyt., i., 257.—J. Sadler in Trans. Bot. Soc. Edin.

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KIRKCUDBRIGHT.—[73. Pr. *W. Lowlands.*] Drained by Dee and small streams into Solway Firth.

2.—New B.G., 412.

Colvend.—P. Gray in Phyt., iii., 348, 740.—J. Fraser in Trans. Dumfries and Galloway Nat. Hist. & Antiq. Soc., 1866.—Id. in Handbook to C. and Southwick, 1873.

WIGTON.—[74. Pr. *W. Lowlands.*] Drained by Cree, Luce, &c., into Irish Sea.

2.—New B.G., 410. No list of common plants obtained by Mr. Watson.

AYR.—[75. Pr. *W. Lowlands*] Chiefly drained by Ayr, Irvine, &c., to W. coast, part of E. by Nith into Solway Firth.

2.—New B.G., 415.—Landsborough, Botany of A., 1872.

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R. Hennedy, Clydesdale Flora, 1865 (see LANARK).

RENFREW—[76. Pr. *W. Lowlands.*] Entirely in the Clyde basin.

2.—New B.G., 417.

The Clydesdale and Glasgow Floras contain localities in R.

LANARK.—[77. Pr. *W. Lowlands.*] Southern boundaries natural. Nearly all in Clyde basin, small portions on E. border drained E. into Frith of Forth.

1.—Patrick, Pop. Description of the Indigenous Plts. of L., 1831.

2.—New B.G., 419.—R. Hennedy, Clydesdale Flora, 1865; ed. 2., 1869; Nat. system; descriptive; no Cryptogams.—J. Bryce, Geology of Clydesdale and Annan, 1859.

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PEEBLES.—[78. Pr. *E. Lowlands.*] Entirely in Tweed basin.

2.—New B.G., 426. No list of common plants obtained by Mr. Watson.

SELKIRK.—[79. Pr. *W. Lowlands.*] Entirely in Tweed basin.

2.—New B.G., 426. No list of common plants obtained by Mr. Watson.

ROXBURGH.—[80. Pr. *W. Lowlands.*] Chiefly in Tweed basin, S. part drained by Esk into Solway Firth.

2.—New B.G., 426.

Teviotdale.—Murray in Trans. Hawick Archælogical Soc.

Jedburgh.—Fungi, A. Jerdon in Phyt., N.S., ii., 49.

NORTHUMBERLAND and CUMBERLAND Floras contain localities in R.

BERWICK.—[81. Pr. *E. Lowlands.*] Entirely in Tweed basin.

1.—G. Johnston, Flora of Berwick-upon-Tweed, 1829, 31; Linnean System; descriptive; no districts; includes Cryptogams, and a sketch of progress of botany in B.—Supplement, including Cryptogams, in Proc. B. Nat. Club.

2.—New B.G., 428.

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3.—Herbarium of Border plants, coll. by G. Johnston in Museum of Tweedside Phys. and Antiq. Soc., Kelso.

HADDINGTON.—[82. Pr. *E. Lowlands.*] Drained by Tyne into North Sea.

2.—New B.G., 436.

See the Floras of EDINBURGH.

Bass Rock.—Balfour in History of the B.R., 1848 & 1855.

EDINBURGH.—[83. Pr. *E. Lowlands.*] Chiefly drained by small streams into Frith of Forth, S. part in basin of Tweed.

1.—J. H. Balfour and J. Sadler, Flora of E., 1863. Radius of 20-30 miles, includes portions of eleven other counties; no districts or arrangements of localities; no authorities quoted; lists of Mosses and Lichens.

2.—New B.G., 438.

Edinburgh.—Woodforde, Cat. of plants round E., 1824.—Greville, Flora Edinensis, 1824; Linnean System; includes Cryptogams.—R. Sibbald, Scotia Illustrata, 1684, pt. 2., pp. 57-71.—R. Maughan in Mem. Wernerian Soc., i., 215 (1811), includes Cryptogams.—Yalden's MSS. in Bot. Dep. Brit. Mus.

3.—University Herbarium at Edinburgh Bot. Gardens.

LINLITHGOW.—[84. Pr. *E. Lowlands.*] Drained by small streams into Firth of Forth.

2.—New B.G., 442.

See Floras of EDINBURGH.

FIFE and KINROSS.—[85. Pr. *E. Highlands.*] Drained by Eden, Leven, &c., to North Sea and Frith of Forth.

2.—New B.G., 450.—Lawson in Phyt., iii., 129.—Mosses, C. Howie in Phyt., N.S., iii., 212, iv., 483.—Id., Musci Fifenses (dried specimens).

See the EDINBURGH Floras.

STIRLING.—[86. Pr. *E. Highlands.*] Chiefly drained W. by Endrick into Loch Lomond, E. portion by Forth into Frith of Forth.

2.—New B.G., 455.—List of common plants very incomplete; H. C. Watson.

PERTH.—[87 West (with CLACKMANNAN), 88 Mid., 89 East. Pr. *E. Highlands.*] Northern and Western boundaries natural. 88 and 89 drained by Tay into Forth Sea, 87 by Forth into Frith of Forth.

2.—New B.G., 465 and (Clackmannan) 450.—See Proc. P. Soc. of Nat. Science.

Perth.—L. Lindsay in Phyt., N.S., ii., 284.—J. Sim in Phyt., N.S., iii., 33, 96; iv., 132.

Blair Athol.—Lichens, Crombie in Grevillea, i., 170.

A complete Flora is in preparation by Dr. Buchanan White and Mr. J. Sadler.

FORFAR.—[90. Pr. *E. Highlands.*] Drained by N. and S. Esk into North Sea, S. portion in Tay basin. North boundary natural.

1.—W. Gardiner, Flora of F., 1848. Natural System; no districts; all the Cryptogams included. Popular style.

2.—New B.G., 474.—R. Brown (1792), J. Bot., 1871, 321.—G. Don in Headrick's Survey in F., 1813; Appendix B., pp. 11-59.—Id., Herbarium Britannicum, Fasciculi of dried plants, 1804, &c.—Graham in Edinburgh New. Phil. Journ.—Anderson's Guide to the Highlands, &c., 1834.

Breadalbane Mountains.—Gardiner in Phyt., i., 468.

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3.—Good set of Gardiner's plants in the British Museum.

KINCARDINE.—[91. Pr. *E. Highlands.*] Drained by Dee and smaller streams into North Sea.

2.—New B.G., 497.—G. Dickie, Flora Abredonensis, 1838.—P. Macgillivray, Flora of Aberdeen, 1853; localities in K. distinguished.—A. Murray, Northern Flora, 1836 (see ABERDEEN.)

ABERDEEN.—[92 South, 93 North. Pr. *E. Highlands.*] Drained by Don and Dee and smaller streams to E. coast, and by Doveran, &c., to N. coast. S.W. boundary natural.

2.—New B.G., 488.—A. Murray, The Northern Flora (includes also Kincardine, Banff and Elgin, and parts of Sutherland, Ross, Inverness and Forfar). Incomplete. Pt. 1, 1836, to end of Pentandria Monogynia. Linnean System. Descriptive.—G. Dickie, Bot. Guide to A., Banff and Kincardine, 1860.

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Rev. J. M. Crombie is preparing a complete Flora of Braemar.

BANFF.—[94. Pr. *E. Highlands.*] S. part in Spey basin, rest by Doveran and small streams to N. coast.

2.—New B.G., 497.

ELGIN.—[95. Pr. *E. Highlands.* Includes a piece of Inverness.] Drained by Spey and Findhorn to N. coast.

1.—[G. Gordon] Collectanea for a Flora of Moray, 1849. Includes Nairn and part of Inverness; Linnean System; no Cryptogams.

INVERNESS.—[96, Easterness, Pr. *E. Highlands*; 97 Westerness, Pr. *W. Highlands.*] S.E. boundary natural. 96 drained by Findhorn, Loch Ness, and Beauley to Moray Firth, 97 by Loch Lochy and small streams to West coast.

2.—New B.G., 502, 503.

Argyle (Mainland).—[98. Pr. *W. Highlands.*] Drained by Loch Awe and many small streams to W. coast. Part of W. boundary natural.

2.—New B.G., 460.

Dumbarton.—[99. Pr. *W. Highlands.*] Drained by Loch Lomond, in Clyde basin.

2.—New B.G., 457.—R. Hennedy, Clydesdale Flora (see Lanark).

Clyde Isles.—Bute, Arran, Cumbrae, &c.—[100. Pr. *W. Highlands.*]

2.—New B.G., 460.—R. Hennedy, Clydesdale Flora.

Arran.—D. Landsborough, Excursions to Arran, &c., 1852, pp. 190-3.—J. Bryce, Geology of other Clyde Islands, ed. 4, 1872, pp. 228-251.

Cantire.—[101. Pr. *W. Highlands.*]

2.—Balfour in Phyt. ii., 291, 321.

South Ebudes. Isla, Jura, &c.—[102. Pr. *W. Highlands.*]

2.—Balfour in Phyt. ii., 291, 321.

Mid Ebudes. Mull, Coll, &c.—[130. Pr. *W. Highlands.*]

No list of common plants obtained by Mr. Watson.

North Ebudes. Skye, Rum, &c.—[104. Pr. *W. Highlands.*]

2.—New B.G., 503 (under Inverness).—T. Pennant, Tour in Scotland and Voyage to the Hebrides, 1774-6.—M. A. Lawson in J. Bot., 1869, p. 108.

Ross.—[105 West, 106 East. Pr. *N. Highlands.*] 105 drained by small streams to W. coast, 106 by Carron, Conan, &c., to E. coast.

2.—New B.G., 508.—No list of common plants obtained for 105 by Mr. Watson.

Sutherland.—[107 East, 108 West. Pr. *N. Highlands.*] 107 drained by Brora and Loch Shin to E. coast; 108 by small streams to N. and W. coasts.

2.—New B.G., 512.—Graham in Edinb. New. Philos. Journ., 1828, p. 593.

Caithness.—[109. Pr. *N. Highlands.*] Drains N. and S. from a central watershed.

2.—N.B., 616.

Hebrides.—[110.]

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2.—New B.G., 517.—J. Wallace, Account of Islands of O., 1700. —Neill's Tour in O. & Shetland.—C Clouston, Guide to the O. Islands, 1862.—H. C. Watson in Journ. Bot., 1864, p. 11.

Shetland Isles.—[112.]

1.—T. Edmonston, Flora of S., 1845.—R. Tate in Journ. Bot., 1866, p. 2.—H. C. Watson in Journ. Bot., 1866, p. 348.

2.—New B.G., 520.—T. Edmonston in W. D. Hooker's Notes on Norway, 1839, pp. 111-117.—Id. in Ann. and Mag. Nat. Hist., 1841, p. 247.

3.—R. Tate's plants in the British Museum.

NOTES ON *EBENACEÆ;* WITH DESCRIPTION OF A NEW SPECIES.

By W. P. Hiern, M.A.

The quantity of new material which has accumulated during the year and a third that has elapsed since the completion of my Monograph of *Ebenaceæ*, is fortunately much less than what reached me during the year of printing and in time to be included in it; still a few particulars require to be added in order to bring the information well up to the present time.

With regard to the economic products of the family, it has long ago been related by Thunberg in his travels, that the berries of the Cape Guarri bush, *Euclea undulata*, Thunb, when bruised and fermented, yield vinegar; modern writers, however, do not mention it, and the practice has probably fallen into disuse.

The Kei Apple, an indigenous Natal fruit which furnishes a good substitute for currant jelly, has been classed in some catalogues as belonging to an Ebenaceous plant, from the general appearance of its fruit; it is really a member of the Family *Bixineæ*, and is the berry of *Aberia Caffra*, Hook. f. & Harv.

In Bengal the leaves of *Diospyros Tupru*, Buch., a species which is the *D. esculenta* of Rosenthal, and which Dr. Brandis deems identical with *D. melanoxylon*, Roxb., are sometimes used as dishes by the natives; and in the North-West Provinces of British India, according to Dr. J. L. Stewart, ploughs combs and cogs for wheels are made from its wood, and insects are said not to touch it; the raspings of the wood are officinal and are prescribed as an alterative. The fruit of *Diospyros montana*, Roxb., is not eaten, being regarded as poisonous, but is used in the Punjab as an application to the hands in case of boils.

The ebony tree gum, known by the name of Kendka Gand, is said in a report on the gums and resinous products of India, published in 1871 by the Government of India, to be used to remove obstructions of the vision.

With regard to the affinities of *Ebenaceæ*, it has been suggested to me to compare with it the ovular structure of the group formed by *Loranthaceæ* and *Santalaceæ;* the affinity appears to hold only through *Olacineæ* and *Ilicineæ*, Orders which have close relations both to *Ebenaceæ* on the one hand, and to the suggested Orders on the other.

In the jungles of India, a botanical correspondent writes. The only order with which a person in passing is very likely to confound *Ebenaceæ* is *Guttiferæ*, to which, in young fruit for instance, the resemblance is very striking. On account of this striking resemblance, the fruits of the Indian trees *Diospyros Embryopteris*, Pers., *D. Ebenaster*, Retz., and *D. discolor*, Willd., are called the wild or false Mangosteen; the true Mangosteen being a delicious fruit furnished by the Guttiferous plant, *Garcinia Mangostana*, Linn.

The Order *Cyrilleæ* is placed by some authors next to *Ebenaceæ*. This small Order, as pointed out by Baillon, consists of two parts, which differ in the number of ovules in each cell of the ovary; the first part, represented by the genus *Cliftonia*, has the ovules solitary; and the second part, represented by the genera *Cyrilla* and *Elliottia*, has several ovules together. The affinity of the first part is closer to *Ilicineæ* than to *Ebenaceæ*, and of the second part closer to *Ericaceæ* than to *Ebenaceæ*.

With regard to new species and varieties, the few following must be mentioned Mr. Kurz in the Journal of the Asiatic Society of Bengal, vol. xlii., part 2, page 88, 1873, has published as a new species his *Gunisanthus mollis*, a plant from Martaban, which he previously noted in his manuscript as *Diospyros mollis;* the characters given by him do not extend to the female flower or fruit, nor does he give any particulars relating to the interior of the male flowers. I am, therefore, unable either to determine the distinctness of the species, or, having merged the genus *Gunisanthus* in *Diospyros*, to assign it a proper position in the latter: it may, however, be closely related to *Diospyros pilosula*, Wall., a species which is known to occur amongst the mountains of Silhet and also in Pegu. It scarcely appears to be identical with the *D. mollis*, i.e., *D. Ehretioides* var. *mollis* of Wallich, which occurs in the Tavoy district. There is another *Diospyros mollis*, one that had escaped my notice, from the Shan Country on the borders of Burmah and Siam, published and figured from a fruiting specimen by Griffith, so long ago as 1844, in the third volume of the Journal of the Agricultural and Horticultural Society of India, p. 145; this is the Black-dye plant of the Shans. The Shans dye articles, such as silk, cotton, &c., with the berry in the raw state; cloth dyed with it without any ingredient is said to stand constant wear for several years without losing its colour; they sometimes, however, mix a small portion of iron-filings to give it an additional hue, and at other times lime, according to their fancy. The black dye is produced from the pulp growing round the plum-like fruit, which is of a very light colour inside, until broken and exposed to the air and sun, when it gradually assumes an intense black colour. Further information about this valuable plant is much needed.

Mr. Bolus, of Graaf Reinet, South Africa, has sent to Kew from the hills of his own neighbourhood a specimen, no. 616, of an interesting shrub with an edible fruit; it is a new variety of a common Cape plant, and it may be called *Royena hirsuta*, Linn., var. *rigida;* or it may prove to be a closely allied but distinct species. It differs from the type by a more rigid habit with numerous patent branches, by narrower calyx-lobes, and by a less hairy corolla with lanceolate-oblong lobes. I have not seen the fruit.

Mr. Bolus has also drawn my attention to the presence of little glands at the base of the ovary in another specimen of his, no. 470, *Royena hirsuta*, Linn.; I do not, however, yet find them in the other species of this genus.

In the Oxford University herbarium there is a new variety of a species of *Diospyros* from Brazil, collected by Riedel, which I call *D. peruviana*, var. γ. *Riedelii;* it has leaves lanceolate-oblong acuminate 4½-6 by 1-1½ in.; petioles ⅛-⅕ in. long, stamens in the only male flower examined 72

The following is a new species from Brazil collected by Burchell, October 5, 1827; the specimen had heen sorted into a different natural order in the Kew herbarium and has only very recently been seen by me.

DIOSPYROS BURCHELLII, *Hiern.*—D. fulvo-hispida, foliis alternis late obovatis coriaceis obtusis basi cuneatis breviter petiolatis, floribus masculis confertis brevissime cymosis subsessilibus basi bracteatis tetrameris partitis, calycis lobis lanceolatis, corollæ lobis obovato-oblongis patentibus, staminibus circiter 26 basi corollæ insertis filamentis pilosis antheris linearibus glabris, ovarii rudimento globoso hirsutissimo.

Arbuscula 15-pedalis. Folia 6-7½-poll longa, 3-4½-poll. lata, petiolo ⅜-½-pollicari. Bracteæ imbricatæ. Flores masculi ¾-pollicares, virides. Calyx ½-pollicaris. Corollæ lobi obtusi, secus dorsum sericei. Stamina pleraque gemina. Flores feminei ac fructus adhuc ignoti.

Habitat in Brasiliæ tropicæ provinciâ Goyaz, inter "Campo-Aberto" et "S. Basio," prope oppidum "Bomfim," in pascuis collinis; collegit atque annotavit cl. *Burchell*, no. 6107.

Species nova, *D. coccolobæfoliæ*, Mart. affinis.

A few more new fossils have been published as belonging to *Ebenaceæ;* it, however, still remains that only two or three species, namely, *Diospyros brachysepala*, A.Br., *Royena græca*, Ung. (not *Euclea relicta*, Ung., as printed by mistake on page 272 of the Monograph), and perhaps *D. oocarpa* (part), Sap. non Thw., appear to me to be satisfactorily established as members of the family. Some remarks on the value of the determinations of the so-called Ebenaceous fossils were communicated by me to the Botanical Congress held at Florence in May last.

ON SOME ASIATIC *CORYLACEÆ*.

BY H. F. HANCE, PH. D., ETC.

1. *Quercus* (*Cyclobalanus*) *Woodii*, sp. nov.—Ramulis glabris v. obsolete furfuraceo-squamulosis, foliis brevipetiolatis e basi cuneata oblongis integerrimis coriaceis glabris supra subopacis subtus pallidis costulatis costulis sub angulo 40° egressis, cupulis sessilibus solitariis patelliformibus diametro pollicaribus tomento brevi cinereo dense obtectis zonis concentricis 7-8 basin conico-tumidum versus valde indistinctis marginem versus magis approximatis et paulo conspicuioribus, glande brunnea late ovoideo acutiuscula pollicem alta præter

verticem cinereo-tomentosum glaberrima nitidiuscula stylis tribus crassis brevibus stigmatibus punctiformibus depressis coronata.

In insula Luzon Philippinarum legit am. W. W. Wood, cujus benevolentiæ unicum debeo specimen.

Amongst the Asiatic oaks known to me this appears most closely allied to the Sumatran *Q. omalokos*, Korth.! and *Q. Miqueliana*, Scheff.![*] from the island of Bangka. It agrees with the first in the size of the acorn, which is, however, of a somewhat paler brighter brown, more curved at the sides, and sharper at the apex. The second has acorns more like my species in shape, but with a sharper top, and they are scarcely more than half the size; the cup-zones are also much more clearly defined. In foliage it is unlike either, resembling rather, in the pallid under-surface of the leaves and their more conspicuous primary veins, *Q. Korthalsii*, Bl.! It differs manifestly from all the Philippine oaks described in the Prodromus, of which I have in vain endeavoured to procure specimens. I have dedicated this species to its discoverer, an American gentleman, whose acquaintance I had the pleasure of making during a visit to Manilla, in the autumn of 1871. Mr. Wood has long resided in the Philippines, where in 1836 he met Gaudichaud, then on board the *Bonite;* and he rendered essential service to the late Hugh Cuming, during his exploration of this magnificent group of islands.

2. *Quercus* (*Cyclobalanus*) *umbonata*, sp. nov.—(Foliis floribusque ignotis), cupula turbinato-patelliformi lignosa crassa tomentella 20 lin. diametro pollicem alta zonis concentricis 4 indistinctis irregulariter tumidis lineas tantum separatis notata summa marginem crassissimum efformante e seriebus plurimis squamarum obsoletarum latarum conflata reliquis esquamosis, glande depressa præter hilum carpicum glaberrimum totam basin occupans tomento pallido fulvo velutino obtecta ad altitudinem 5-linealem ultra cupulam exserta medio depressa umbonem validum conicum stylis tribus crassis connatis coronatum gerente.

In insula Penang legit Dr. J. B. King, a. 1865.

I regret being obliged to characterise this from the fruit alone, but am unwilling to leave so fine and well-marked a species undescribed; and I was assured it was quite impossible to obtain leaves, the trunk rising amidst the forest to a height of 100 feet before sending off a single branch. Dr. Hooker, to whom some years since I sent a sketch of the fruit, informed me that specimens from Dr. Wallich exist in the carpological collection at Kew, but that there also it has never been matched with foliage. Amongst published species, I believe it stands nearest to *Q. platycarpa*, Bl.![†]

3. *Quercus Wallichiana*, Lindl., described by me four years ago,[‡] from specimens kindly identified by Prof. Oliver with Wallich's original ones at Kew, has nothing in common with *Q. lamellosa*, Sm., to which Alphonse De Candolle referred it. It is a true *Pasania*, notwithstanding the cup, and its nearest ally is *Q. brevipetiolata*, Scheff.![§] from the island of Bangka.

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[*] Scheffer, Observ. Phytolog., ii, 47.

[†] Blume, Fl. Jav., iii. Cupulif., t. 15.

[‡] Seemann, Journ. Bot., viii., 4.

[§] Scheff., Obs. Phytol., ii., 47.

4. *Quercus sclerophylla*, Lindl., left by A. De Candolle, who had seen no specimens, amongst the doubtful *Lepidobalani*, is a remarkable species. It is a somewhat aberrant member of the group of the *Eupasaniæ*, from which it forms, I think, a direct transition to the section *Chlamydobalanus*, through *Q. cuspidata*, S. & Z., which it greatly resembles in its erect filiform interrupted ♂ spikes, arranged in panicles, in the structure of its ♂ flowers, and in the texture of its leaves, the sharp callose teeth of which are found only in one or two other *Pasaniæ*. The ♀ flowers are solitary or approximated on the rachis, the 3 or 4 cylindrical styles are free to the base,* and the cotyledons conferruminate. The scales of the woolly cup, in their irregular shape, size and disposition, closely approach those of the Japanese oak,† as may be seen by a comparison of young fruit of the latter, though more numerous and fully developed; and this affinity is further indicated by the curious circumstance that, though the cup does not cover the acorn, it always splits irregularly as the latter ripens. On the other hand, an approach is made to *Castanopsis* by *Quercus Junghuhnii*, Miq. ! (= *Q. acuminatissima*, A.DC.), the cupules of which are sometimes curiously spiny ;‡ and notably by a remarkable inedited Bangka species, with singular discoidal fruit, sparingly covered with spines arranged in 3-4 irregular distant concentric circles, these spines being glabrous at the tips, and frequently compound, precisely as in genuine species of *Castanopsis*. For specimens of this I am indebted to the liberality of Dr. Scheffer, Director of the Buitenzorg Gardens, who has given me full authority to describe and name it as I now do.

5. *Quercus discocarpa*, sp. nov.—Ramulis purpurascentibus glabris lenticellatis, foliis brevipetiolatis e basi cuneata oblongo-lanceolatis acuminatis integerrimis coriaceis glabris 3-6 pollicaribus supra lucidulis subtus opacis et pallide cinnamomeis costulatis costulis utrinque 9 sub angulo 40° egressis, fructibus ad apices ramulorum aggregatis oppositis crasse stipitatis discoideis subtus concavis supra convexis (quodammodo igitur fungiformibus) 4 lin. tantum altis diametro 8-lineali cinereo-velutinis aculeis parvis (linea brevioribus) inæqualibus complanatis simplicibus v. compositis apice glaberrimis in series 3-4 concentricas remotas dispositis armatis monocarpis indehiscentibus, glande basi cupulæ arcte adhærente ambitu subangulata depresso-pyramidata pallide brunnea sericea stylo crasso brevi coronata.

In ins. Bangka Archipelagi Malayani. (Herb. Hort. Bogor., n. 7001.)

I regret that I have been unable to examine the ovary or the structure of the cotyledons (the seeds being atrophied or destroyed in my specimens) of this curious species, which seems allied on the one hand to *Q. Jughuhnii*, Miq., and on the other to *Castanopsis echidnocarpa*, A.DC. Alphonse De Candolle and Oersted, however, assign to the species included in both *Chlamydobalanus* and *Castanopsis* free acorns; in the present tree they require some force to detach them from the involucre.

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* They are very much like Oersted's figure of those of *Q. fenestrata*. (Aperçu, tab. i-ii., f. 24.) The distinction drawn by this author between the connate styles of *Cyclobalanus* and the free ones of *Pasania*, and their relative length in the two, is perhaps too absolute.

† They are not well figured in Siebold and Zuccarini's plate. (Fl. Jap., t. 2).

‡ Oudemans, Annot. crit., in Cupulif. javan., t. ix., f. 11.

6. *Castanopsis Chinensis*, Hance.—Excellent specimens of this, with perfectly ripe fruit, gathered on the White Cloud Hills, above Canton, enable me to correct or add somewhat to my original diagnosis,* thus:—Fructibus maturis diametro pollicaribus globosis monocarpis sordide ferrugineo-tomentosis spinis compositis basi ferrugineo-tomentosis apice glaberrimis flaventibus undique dense obsessis, glandibus præter apicem tomentellum glaberrimis testaceis ovoideis acutis semipollicaribus basi hilo carpico ruguloso notatis, foliorum dentibus callosis spinulosis. In *C. tribuloides*, A.DC., which is unquestionably the nearest ally of this species—not *C. echidnocarpa*, as I had supposed when I possessed less perfect specimens than are now at my disposal—the involucre usually contain two nuts, is clothed with rufous down, the spines are shorter and less closely set, the petioles not half as long, the leaf-serratures are not spinulose, the primary veins are closer placed and more elevated on the under-surface of the leaf, and the reticulation of the veinlets is closer and finer.

It will be observed that, in describing the above new species, I have referred them to *Quercus*. Whilst fully recognising the value of the late Prof. Oersted's labours, and the very greatly improved arrangement elaborated by him; and carefully weighing his arguments† as to the importance of the differences in size and position of the stigma, the erect or pendent catkins, the cup-scales and the foliage, I am unable to concur in the conclusions at which he arrived. I willingly admit that *Pasania*, *Cyclobalanus* and *Cyclobalanopsis* may have as good claims to distinction as *Castanopsis* itself; but I think the characters employed for this purpose are not such as can fairly be considered of generic value, and am still of opinion that it would be preferable to reduce both *Castanopsis* and *Castanea* to *Quercus*.

ON THE GENUS *ANDROCYMBIUM*, WITH DESCRIPTIONS OF SEVEN NEW SPECIES.

By J. G. Baker, F.L.S.

The genus *Androcymbium* represents at the Cape, with a single out-wandering member in Abyssinia, our European *Merendera* and *Erythrostictus*, and is the only other genus of polyphyllous bulbous *Colchicaceæ* in which there is a distinct claw to the perianth-segment from the tip of which the filaments arise. It is a genus with a very peculiar habit of growth, the flowers being aggregated in a dense corymb which is usually sessile and forms a tuft like a large button on the surface of the soil, surrounded on all sides by a rosette of tapering leaves which hide the flowers from view except when we look at them from above. Three Cape species have long been known, and are described in the 4th volume of Kunth's Enumeratio, page 152-3, but as Professor Harvey has already stated in the second edition of his Cape Genera, there are several others to be added. A new one was lately sent by Mr. MacOwan to the gardens at Kew, and cultivated at the temperate end of the new T house, but unfortunately it failed either to perfect seed or establish itself by means of corm-multiplication. I find there is material available now for characterising eleven species, three new ones having been found by Burchell fifty years ago in his exploration of the barren tract in the very heart of the colony, which have never been characterised. The whole are quite uniform in general habit, but they fall into three groups according to the extent to which the leaves that immediately surround the corymb, or, as we may call them, the general bract leaves, are modified from the lower leaves or typical foliar leaves. In one group these bract-leaves are not modified at all either in shape or texture; in a second group they are much shorter and blunter, and more membranous or chartaceous in texture, but are not distinctly striped; and in a third group they are greatly modified in form, with an almost petaloid texture (like the upper bracts of *Salvia Horminum* or *Lavandula Stœchas*) and are marked with close very distinct vertical stripes on a pale ground which are green in an early, and brownish in a late stage.

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* Journ. Linn. Soc. Bot., x., 201.

† Recherches sur la classific. des Chênes (Copenhag., 1867.), pp. 3 sqq.; Aperçu sur la classific. des Chênes (Leipz., 1869), pp. 13-14.

Genus ANDROCYMBIUM, *Willd.* Perianthium corollinum 6-partitum infundibulare, segmentis æqualibus longe unguiculatis, marginibus laminæ lanceolatæ acuminatæ deorsum valde convoluto-cucullatis Stamina 6, filamentis filiformibus ad basin laminæ insertis inclusis vel leviter exsertis, antheris oblongis vel lineari-oblongis prope basin affixis bilocularibus extrorsis. Ovarium globosum sessile triloculare, ovulis in loculo crebris biseriatis, carpellis apice liberis in stylos persistentes erectos subulatos apice stigmatoso uncinatos desinentibus. Capsula membranacea septicide trivalvis, seminibus crebris parvis biseriatis triquetris, testa brunnea membranacea, albumine corneo. *Herbæ acaules vel breviter caulescentes, bulbo vel corio tunicato, floribus albidis vel viridulis dense corymbosis sessilibus vel pedicellatis, foliis elongatis ascendentibus, interioribus sæpe difformibus bracteiformibus, cinctis.*

GROUP 1. Folia interiora exterioribus multo breviora obtusiora albida membranacea venis verticalibus viridibus vel brunneis decorata.

1. A. MELANTHIOIDES, *Willd.*, *Kunth Enum.*, iv., 153.—Breviter caulescens, foliis propriis 2-3 linearibus haud aggregatis 6-8 poll. longis profunde canaliculatis, bracteiformibus 3-9 ovatis vel oblongis acutis 1-3 poll. longis, floribus 6-12 distincte pedicellatis, perianthio albido 5-6 lin. longo, ungue lamina triplo breviori, lamina acuminata basi deltoidea, filamentis exsertis, antheris luteis anguste oblongis ½-¾ lin. longis. *Cap. B. Spei, late disseminata*, Burke 285 !, Bolus 264 !, MacOwan !, etc. Flowers from January to March, and ascends to 4300 feet in Graaf-Reinet.

2 A. STRIATUM, *Hochst. in Schimp. Iter Abyss.*, No. 1338.—Breviter caulescens, foliis propriis 2-3 linearibus canaliculatis ascendentibus acuminatis 3-5 poll. longis haud aggregatis, bracteiformibus 3-4

ovatis vel lanceolatis acutis 1-1½ poll. longis, floribus 3-6 pedicellatis, perianthio albido 3-4 lin. longo, ungue subulato lamina lanceolata triplo breviore, filamentis lamina æquilongis, antheris oblongis ½ lin. longis. *Abyssinia*, Schimper, 1338! 323 anno 1853. May prove a mere variety of the last.

3. A. SUBULATUM, *Baker*, *n.sp.*—Acaulis, foliis propriis 2-3 aggregatis subulatis 6-8 poll. longis basi sæpe dilatatis, bracteiformibus 3-4 oblongis vel lanceolatis acutis 1½-2 poll. longis, floribus paucis sessilibus, perianthio 6-7 lin. longo, ungue subulato lamina lanceolata æquilongo, filamentis distincte exsertis, antheris flavis oblongis ½ lin. longis. *Cap. B. Spei* (on a wooded sandbank south of the Umzweswie. River, South African Gold Field, June 15, 1870.) T. Baines!.

GROUP 2. Folia interiora exterioribus multo breviora obtusiora magis chartacea obscure nervata, venis perspicuis haud decorata.

4. A. LEUCANTHUM, *Willd.*, *Kunth Enum.*, iv., 153. (*A. eucomoides*, Sweet Brit. Flow. Gard., t. 165, non Willd.) Acaulis vel subacaulis, foliis propriis 2-4 aggregatis lanceolatis firmis acuminatis 3-9 poll. longis, bracteiformibus 2 ovatis acutis sæpe inæqualibus 1-3 poll. longis demum membranaceis vel subcoriaceis crebre brunneo-punctatis, floribus multis breviter pedicellatis, perianthio albido 6-8 lin. longo demum membranaceo brunneo-punctato, ungue applanato lamina lanceolata æquilongo, filamentis vix vel demum exsertis, antheris luteis oblongis 1 lin. longis. *Cap. B. Spei*, *late disseminata*, Zeyher, 122! 1720!, Drege, 2709!, Burchell, 5628!, etc. This is the oldest-known species of the genus, having been gathered by Thunberg and described in his Prodromus under the name of *Melanthium capense*.

5. A. EUCOMOIDES, *Willd.*, *Kunth Enum.*, iv., 153, *excl. syn. Sweet.*—Acaulis, foliis propriis duobus aggregatis lanceolatis acuminatis carnosis 6-12 poll. longis 1½-2 poll. latis, bracteiformibus 2 ovatis vel ovato-lanceolatis 1½-6 poll. longis acutis vetustate subcoriaceis, floribus multis corymbosis pedicellatis, perianthio viridi 9-12 lin. longo, ungue lamina æquilongo, lamina deorsum deltoidea marginibus valde incurvatis, filamentis lamina æquilongis, antheris basifixis flavis 3 lin. longis. *Capitis Bonæ Spei ditio centralis*, Burchell, 1339! 1395!.

6. A. CUSPIDATUM, *Baker*, *n.sp.*—Acaulis, foliis propriis duobus lanceolatis acutis 2-3 poll. longis carnoso-subcoriaceis siccitate crebre nervatis basi interdum breviter petiolatis medio 6-8 lin. latis, bracteiformibus 2 inæqualibus subchartaceis, exteriori ovato-lanceolata propriis vix breviore, interiori obovato corymbum haud vel vix superante apice late rotundato minute cuspidato, floribus paucis subsessilibus, perianthio viridi 9 lin. longo, ungue applanato lamina lanceolata æquilongo, filamentis lamina distincte brevioribus, antheris basfixis flavis anguste oblongis 2 lin. longis. *Capitis Bonæ Spei*, *ditio centralis ad ripas fluminis Reed*, Burchell, 1376!.

7. A. VOLUTUM, *Burchell MSS.*—Acaulis, foliis propriis duobus lanceolatis ascendentibus 3-4 poll. longis apice acuminatis insigniter revoluto-circinnatis, bracteiformibus, duobus ovatis vetustate chartaceis suberectis acutis subobtusis 1-2 poll. longis, floribus paucis subsessilibus, perianthio albido 6 lin. longo, ungue subulato lamina basi deltoidea æquilongo, filamentis lamina æquilongis, antheris flavis

basifixis exsertis 1½ lin. longis. *Capitis Bonæ Spei ditio centralis*, Burchell, 1215! 1403! (Between Stink-fintein and Seldery-fontein, and between the Kleine-doorne River and Groote-doorne River.)

8. A. Burchellii, *Baker*, *n.sp.*—Acaulis, foliis propriis duobus patulis oblongo-lanceolatis 3 poll. longis obtusis crasse subcoriaceo-carnosis distincte costatis venis occultis, bracteiformibus 2 late ovatis obtusis subchartaceis 1-1½ poll. longis, floribus paucis subsessilibus, perianthio viridi 9 lin. longo, ungue applanato lamina lanceolata duplo superante filamentis distincte exsertis, antheris flavis leviter versatilibus 2 lin. longis. *Capitis Bonæ Spei*, Burchell, 1401. (With the last between Stink-fontein and Seldery-fontein.)

Group 3.—Folia omnia acuminata interiora exterioribus minora sed textura et forma consimilia.

9. A. punctatum, *Baker*, *n.sp.*—Acaulis, foliis 5-6 omnibus lanceolatis acuminatis arundinaceo-carnosis viridibus conspicue canaliculatis exterioribus 5-6 poll. longis, basi 6-9 lin. latis, interioribus minoribus, floribus paucis sessilibus, perianthio 6-7 lin. longo primum albido vetustate brunneo-punctato, ungue subulato lamina lanceolata duplo breviori, filamentis purpureis lamina distincte brevioribus, antheris purpureis basifixis ½ lin. longis. *Capitis Bonæ Spei ditio orientalis*, MacOwan (v. v. in Hort. Kew).

10. A. longipes, *Baker*, *n.sp.*—Acaulis, foliis 5-6 similibus arundinaceo-carnosis longe acuminatis distincte costatis exterioribus 6-9 poll. longis, demum 6-9 lin. latis, floribus multis sessilibus, perianthio ad pollicem longo albido brunneo-punctato, ungue subulato laminam lanceolato-deltoideam duplo superante, filamentis lamina duplo brevioribus, antheris purpureis oblongis basifixis ½ lin. longis. *Caput Bonæ Spei in ditione Somerset*, Bowker!.

11. A. Burkei, *Baker*, *n.sp.*—Acaulis, foliis 4-5 erectis loratis subcoriaceo-carnosis distincte canaliculatis longe acuminatis 9-12 poll. longis basi deltoideo dilatatis supra basin 9-12 lin. latis, floribus paucis sessilibus, perianthio ad pollicem longo, ungue applanato lamina æquilongo, laminæ marginibus valde convolutis, filamentis lamina duplo brevioribus, antheris basifixis 1 lin. longis. *Caput Bonæ Spei ad ripas fluminis Vaal*, Burke!.

SHORT NOTES.

Eryngium campestre, *L.*, in Kent.—Whilst on a botanical tour in Romney Marsh at the end of last month, I unexpectedly came across a considerable quantity of this plant on the sandy waste known as the "Warren" between New Romney and Dymchurch. The plant was growing on the northern slope of one of the large sandhills close by the targets. The spot is well marked by a flagstaff in the immediate vicinity, on which a red flag is hoisted during rifle practice. The plant had every appearance of being indigenous here, as the spot was some distance from the sea, and no ballast or rubbish was to be seen in the neighbourhood. I enclose a specimen with this note. I need scarcely say how botanically interesting the coast between Dun-

geness and Hythe is. I will not here give a list of all I saw, but when I mention *Comarum palustre*, *Silene conica*, *Medicago minima* and nearly all the small rare trefoils, *Frankenia lævis*, *Carex teretiuscula*, *Ranunculus Lingua* in profusion, *C. Pseudo-cyperus*, &c., it may serve to stimulate others to make a more complete search in this interesting, but much neglected district. I may also add that the trenches inland abound in rare aquatic plants.—F. J. HANBURY.

MIDDLESEX PLANTS.—Numerous specimens of *Sedum dasyphyllum*, I am informed by Mr. W. G. Smith, have been sent him from Mr. J. T. Clarke, who writes that it grows on very old walls for about a mile round Hillingdon. There can be little doubt that it is planted there. Since the publication of the "Flora of Middlesex" this *Sedum* has also been found in abundance on the left hand wall of Sion Lane, Isleworth.—The Rev. Dr. Hind sends specimens of *Pyrola minor* from the Grove, on the east side of Stanmore Heath. It occurs in considerable quantity, covering several square yards, under some venerable trees. He states that there appears to be no reason to suppose it introduced.—A rather unlikely casual was shown me by Mr. Warren, on waste ground, formerly a market garden, close to the Gloucester Road railway station, Brompton. This was *Galeopsis speciosa*, Mill. (*G. versicolor*, Curt.); four plants only were seen, all in full flower.—In a neighbouring market garden, planted as an orchard, we noticed a tall *Rumex* growing with *R. crispus*, from which it differed somewhat in habit. Examination showed it to have cordate, broad inner perianth-leaves entirely devoid of tubercles, and I have little hesitation in referring it to *R. domesticus*, Hartm. (*R. longifolius*, DC., *R. aquaticus*, Auct. plur.), although the panicle is less dense and crowded than in most specimens of this northern species, which also occurs in the Pyrenees. It is perhaps usless to speculate how either this plant or the *Galeopsis* came to a London garden; *R. domesticus* is not known in this country south of Yorkshire, but the Docks have been so little attended to that it is likely to occur farther southwards though hitherto unrecorded.—HENRY TRIMEN.

RUMEX HYDROLAPATHUM AND R. MAXIMUS.—I am indebted to Mr. R. A. Pryor for root-leaves from plants collected at Hatfield, Herts, showing a chain of intermediates between the extremes figured in Plate 140, and so far confirming the view of the specific identity of the two plants. Mr. Pryor's specimens show the following conditions:—A rounded cordate base equal on the two sides, a tapering base unequal, and a somewhat abrupt base neither distinctly tapering nor cordate, also unequal. Further examination of our great Water Dock is much wanted, to trace the range of the two forms through the country.—HENRY TRIMEN.

Extracts and Abstracts.

THE DISPERSION OF BRITISH PLANTS.

By T. Comber.

[*Extracts from a paper read before the Historic Society of Lancashire and Cheshire, January 22nd*, 1874.]

Last Session I had the honour of reading before your Society a paper on "The World-Distribution of British Plants."* An attempt was therein made to arrange the members of our flora into certain groups, according to the area they occupy outside of Britain, the larger groups being further subdivided into sections The paper concluded with lists of species, in which a figure was attached to each group or section indicating its extent of area or "degree of distribution." The lowest figure, 1, indicated the most limited area noticed, that of plants which are found only in Europe, in the countries bordering the Atlantic. From this the figures increased, as the areas became more extensive, until 12 represented the dispersion of the most widely ranging species, those which occur not only in all three Continents of the Northern hemisphere, but in more than one of the Southern Continents as well. To each species was thus assigned a figure representing its degree of dispersion: and by averaging these figures we can ascertain the mean *specific* area of any order or class, or of any number of plants possessing in common some distinguishing feature. In the present paper I propose, by means of averages thus obtained, and carried for greater exactness to two places of decimals, to examine into sundry questions respecting the dispersion of plants, many of which have already been treated of by different authors, and especially by Professor Alph. De Candolle in his "Géographie Botanique."

Dispersion with Regard to Latitude.

Wide Range of Northern Plants.—On considering the comparative area of plants, one of the first facts, which cannot fail to attract attention, is that Northern plants range more widely East and West than those of more Southern latitudes.

Two of the causes which have been assigned for this appear evident, viz.; 1st—That the actual extent of ground a plant has to cover to reach from one quarter of the globe to another is much less at a high than at a low latitude. 2nd—That about the Arctic Circle there is almost continuous land, as Asia is separated from America only by Behring's Straits. In the greater expanse of sea which now lies between Europe and America, the intermediate stations of the Faroes, Iceland and Greenland serve as stepping-stones; and the greatest interval between them, that between the Faroes and Iceland, does not exceed 230 miles. Under a favourable climate, and with a sufficient length of time, the spread of a species over land is easy; the chance of seeds being carried across sea, whether by winds, currents, or birds, increases as the distance to be traversed diminishes; and in Northern seas it is considered that icebergs serve as means of conveyance: it is obvious, therefore, that Northern species possess special facilities for migration between the Old and New Worlds, even under existing conditions; and possibly at a tolerably recent geological period conditions may have been still more favourable, as Europe and America may have approached nearer to each other than at present.

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* See pp, 84—88 for an abstract of this paper,

Viewed with regard to their zones our native* plants give the following average degree of dispersion:—

Species.		*Average.*	*Species.*	*Average.*
69	Arctic	9·09		
124	Northern	8·82	490	8·84
297	Temperate, penetrating within the Arctic Circle .	8·79		
366	Temperate, not found within the Arctic Circle .	6·45	661	5·63
295	Southern . . .	4·62		
Total 1151	. . . . . .	7·00		

Dispersion as affected by Station.

Aquatic Plants.—It has long been noticed that aquatic plants, in common with other fresh-water productions, are, as a rule, widely dispersed, and although their number is only moderate, a considerable proportion are cosmopolitan. The average areas of our British species are as follows:—

Species.		*Average.*
49	Aquatic	8·94
268	Semi-Aquatic or Palustral	7·93
834	Terrestrial	6·59

The tendency is most marked in those plants which belong to orders wholly or pricipally composed of aquatic or palustral species. Thus of the 49 aquatic plants—

36	Nymphæaceæ, Haloragaceæ, Hydrocharideæ, Potomaceæ, Lemnaceæ, and Marsileaceæ, average	9·11
13	belonging to other orders	8·46

and of the palustrals—

101	Droseraceæ, Pinguiculaceæ, Alismaceæ, Typhaceæ, Juncaceæ, and Cyperaceæ, average	8·16
167	Belonging to other orders	7·79

Maritime Plants.—Professor De Candolle selects the whole of the two orders Plumbaginaceæ and Salsolaceæ as representatives of maritime or salt-loving plants; and finding that their mean specific area, calculated and expressed according to his method, is 10·3 against 4·5 that of flowering plants generally, he concludes that maritime plants, like aquatics, have a range more extended than the average. Of the

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* Plants known, or even suspected, to be only naturalised in Britain have been excluded from all the comparisons in this paper.

11 individual species he names as instances of particularly wide distribution, 6 appear in our list, yet so far as the British flora is concerned, the degree of dispersion of salt-loving species, including those belonging to other orders as well as to the two named by Professor De Candolle, is less than that of other plants.

Species.	*Average.*
111 Maritime	6·32
1040 Non-maritime	7·07

This discrepancy, and other similar ones that will be met with hereafter, no doubt partly arise from the limited scope of the present inquiry, confined as it is to the British species alone, and from the entirely different methods by which the mean specific areas are ascertained and expressed; but I believe they are chiefly occasioned by the present calculations being based upon individual species, considered each separately, and Professor De Candolle's upon entire orders.

Calcareous Plants.—Those plants that evince in Britain a preference for chalk or limestone soils have a lower degree of dispersion than our other plants.

Species.	*Average.*
81 Calcareous	5·43
1070 Non-Calcareous	7·12

The species classed as calcareous comprise however no aquatic or palustral plants; and as we have seen that such are the widest rangers, a more correct comparison is perhaps one confined to terrestrial plants. It is as follows:—

Species.	*Average.*
81 Calcareous	5·43
753 Other terrestrials	6·71

On the other hand calcareous plants include an undue proportion of Orchids, an order that has only a limited specific range: omitting these again the comparison is:—

Species.	*Average.*
67 Calcareous	5·60
735 Other terrestrials	6·70

Heath Plants.—Species that are usually found on dry heaths, moors, and commons, have also a rather limited degree of dispersion, the comparison between them and other terrestrials being as follows:—

Species.	*Average.*
35 Heath plants	6·31
799 Other terrestrials	6·60

Dispersion in relation to Habit and Duration.

Annuals, Biennials, and Perennials.—The average areas of our herbs, divided according to their duration, disagree entirely with Professor De Candolle's figures based upon the plants of the whole world, by which Monocarpic plants appear more widely diffused than Perennials, while of the former Annuals have a more extended range than Biennials. British herbs give the following result:—

Species.	*Average.*
175 Annuals	6·35
31 Annuals or Biennials	6·13
23 Biennials	5·44
229 Total Monocarps	6·23
296 Perennials	7·31
27 Doubtful duration	6·70

Of the representative orders selected by Professor De Candolle as being largely composed of annual species, the principal is that of Gramineæ, which indeed contains three-eighths of the whole. In this respect our British grasses are different, the great majority of them (seventy-six out of ninety-four) being perennials.

Dispersion according to Character of the Flower.

Structure.—Our sixty-one Cryptogams average 9·51, while our Phanerogams compare as follows:—

Species.	*Average.*
172 Thalamifloræ	6·98
205 Calycifloræ	6·52
306 Monopetalæ	6·41
92 Apetalæ	6·84
775 Total Exogens	6·62
129 Petaloideæ	7·23
186 Glumaceæ	7·55
315 Total Endogens	7·45

Conspicuous Flowers.—Mr. Darwin has shown how important a part is played by insects in the fertilisation of flowers; and how great a benefit is the cross-fertilisation effected by their means. He considers that all plants with conspicuously coloured flowers, powerful odours, or honeyed secretions, are fertilised by insects; "and he concludes that before honey-feeding insects existed, the vegetation of our globe could not have been ornamented with bright-coloured flowers, but consisted of such flowers as Pines, Oaks, Grasses, Nettles, &c."* If this conclusion be correct, plants with inconspicuously coloured flowers have probably attained a greater *age* as species, and, having thus had a longer time for their migration, we may expect to find that they have also a high degree of dispersion, which will be most conspicuous in orders that are entirely composed of such plants. On dividing our British plants to ascertain whether this is the case, I find not only that it is so, but also that plants with *white* flowers are more widely dispersed than those with *coloured,* a result I was not expecting. Further analysis shows that plants with flowers sometimes white and sometimes coloured, such as the Wood Anemone, many of our Violets, Thistles, and Campanulas are intermediate in this respect; having a more limited range than those whose flowers are always white; and on the other hand a more extended range than those with flowers always coloured. The average compare as follows:—

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* The quotation is from Dr. Hooker's Address to the British Association.

Species.		*Average.*
316	Of whole orders having inconspicuous flowers	7·71
64	Other plants with inconspicuous flowers	7·19
380	Total with inconspicuously coloured flowers	7·62
179	With flowers always white	7·04
176	With flowers variable in colour	6·66
355	With flowers always coloured	6·05

Averages taken out separately for yellow, red or pink, blue or purple, and parti-coloured flowers, do not differ much from each other, or from the average of coloured flowers taken all together.

Dispersion according to the Nature of the Fruit.

Fleshy Fruits.—Amongst our British species, the average of fleshy-fruited plants is very little above that of dry-fruited. They compare as follows:—

Species.		*Average.*
71	With succulent fruit	6·92
1019	With dry fruit	6·86

If we exclude from among succulent fruit those containing large seeds, not likely to be swallowed by birds, their average is somewhat raised.

Dehiscence.—Our lists give the following results:—

Species.		*Average.*
584	With indehiscent fruit	6·93
434	With dehiscent fruit	6.76

showing less difference than might be expected. This may arise from the fact that dehiscent fruits have generally more *numerous* seeds, an advantage that may compensate in great measure for the disadvantage of the seeds being exposed naked.

Special adaptation for Dispersion.—The fruits and seeds of certain plants are to all appearance specially adapted for dispersion, being furnished with appendages which enable them to float in the air, and thus be easily wafted about by the wind; or to cling to the coats of animals; and in either case the chance is increased of their being conveyed to a distance. These appendages consist (1) of a coma or pencil of hairs attached to the *seeds*; (2) of a feathery pappus or awn, or (3) of hooked bristles or tubercles, bent or spiral awns, or some other grappling organ, borne by the *fruit* itself. Our native species thus furnished compare as follows:—

Species.		*Average.*
32	With seeds having a coma	7·28
94	With fruit furnished with pappus, &c.	6·39
34	With fruit furnished with grappling organs	6·74
930	Not specially adapted	6·90

These results agree with those obtained by Professor De Candolle, whose calculations also show that whereas a coma attached to the *seed* is accompanied by a wide range, feathery appendages borne by the fruit are not. As regards plants furnished with the latter, several circumstances might be suggested as possibly exerting a counteracting influence; such as that they contain no aquatic species, but on the contrary an undue proportion have an inferior ovary, and nearly all bear coloured flowers and exalbuminous seeds; but on comparing Compositæ by themselves, in which all the conditions referred to are similar, we find

Species.		*Average.*
81	Furnished with feathery pappus . .	5·98
2	With grappling organs	9.50
14	Without pappus	6.36

Dispersion according to Character of the Seed.

Testa.—Differences in the seed deserve our special attention, for it is in this shape that a plant is most likely to be carried from one part of the world to another; and if any peculiarity of the seed enable it better to withstand the various vicissitudes to which it must be exposed during transit, or to establish itself and maintain a footing in the struggle for existence when it has reached a new country, the effect may be traceable in the specific area. We have already seen that a coma or down attached to the seed is accompanied by a high degree of dispersion; and the nature of the testa or outer coat of the seed may next be suggested as likely to exert an influence. It might be anticipated that a thick, hard, leathery, or crustaceous testa would resist for a long time the action of sea-water, and by enabling the seed it encloses to retain its vitality for a lengthened period when carried by oceanic currents, favour its dispersion to a distance.* Such, however, hardly appears to be the case. In Mr. Darwin's experiments on the action of sea-water, seeds endued with a thick testa, *e.g.*, of Leguminosæ and Hibiscus, were amongst the earliest to lose their powers of germination; and the following comparison shows that our plants whose seeds have such a testa reach a lower degree of dispersion than plants whose seeds have a membranous testa on the one hand, or a soft cellulose or mucilaginous testa on the other. Omitting species in which the nature of the testa is doubtful, we have:—

Species.		*Average.*
665	With testa thin or membranous . .	7·03
47	With testa soft cellulose, &c . . .	7.64
192	With testa thick, leathery, or crustaceous	6·05

Albumen.—If the function of albumen be to supply nourishment to the embryo during germination, its possession may enable a seed to retain its vitality longer, and maintain its existence more sturdily when it reaches a new country, than a seed in which no such store of nourishment is provided, and thus favour the dispersion of the species. Whether this be the case or not, we at any rate find that our plants with ex-albuminous seeds have a lower degree of dispersion than those with albuminous; and that among the latter differences in the nature of the albumen are accompanied by variations in the average range; plants in which the albumen is farinaceous exceeding in this respect those in which it is fleshy, dense, or horny.

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* Dr. Hooker, in his paper on the flora of the Galapagos Islands, expresses an opinion that the "indurated seed-coats of some (plants) probably aid them in resisting for some time the effects of salt-water."

Species.		*Average.*
303	With albumen floury or mealy . .	7·37
347	,, fleshy or horny . .	6·80
439	,, absent or very scanty .	6·55

This accords with the experiments of Mr. Darwin on the resistance of seeds to sea-water; in so far as the two orders which he found were soonest killed, Leguminosæ and Malvaceæ, have no albumen; while of the five orders, which retained their vitality longest, Chenopodiaceæ, Polygonaceæ and Gramineæ have a floury, Solanaceæ a fleshy, and Umbelliferæ a dense albumen.

Dispersion according to Classification.

Large Genera.—Mr. Darwin, in support of his views of the nature of a "Species," adduces the fact that large genera comprise a greater proportion of *dominant species* than small genera, the predominance of the species being shown by:—1st, Extensive geographical range: 2nd, General diffusion over the area they occupy: 3rd, Commonness, or the being represented by an abundance of individuals: and 4th, Variability, or a tendency to produce varieties differing from the typical form. Our subsequent comparisons are in this connection, and show that a range more extensive than the average accompanies each of the other characteristics of predominance enumerated above.

Having regard to only our British species, and considering those to be large genera that have eight or more native representatives, we find that:—

Species.		*Average.*
362	Belonging to 25 large genera	7.38
789	Belonging to smaller genera . . .	6·82

General Diffusion.—On this point I have followed Mr. Watson's census of counties in the "Compendium." Classed according to his figures therein given:—

Species.		*Average.*
150	Found in 90 or more counties	8·01
336	Found in 60 to 89 counties . . .	7·24
665	Found in less than 60 counties . .	6·65

Commonness.—Taking as a guide our best-known Floras, I have averaged the plants that are therein described, as "common," "abundant," or "plentiful."

Species.		*Average.*
319	Generally common	7·54
83	Partially common	7·16
749	Less plentiful, or rare	6·75

Variability.—Regarding as variable all species of which more than one form is distinguished by Professor Syme in "English Botany," and averaging separately those in which the variation of the forms is so great that they are ranked as "sub-species," and those of which only "varieties" are recognised, we get the following results :—

Species.		*Average.*
92	Divided into sub-species	7·76
205	„ varieties	7·64
854	Not variable	6·76

Botanical News.

Articles in Journals.

Annales des Sc. Nat. (ser 5, t. xix., n. 4 & 5. February).—J. de Saldanha da Gama, "On some trees employed in S. Brazilian Industry." —Tchistiakoff, "On the Vegetable Cell; 2, Sporangia of *Marattiaceæ*" (tab. 11-13).—E. Fournier, "On the Geographical Distribution of the Ferns of New Caledonia."—J. Vesque, "On Crystals of Calcium Oxalate in Plants and their artificial production."—E. Bornet, "Second note on the Gonidia of Lichens."

June.

Grevillea.—M. J. Berkeley, "Notices of N. American Fungi" (contd.).—H. A. Weddell, "Remarks on Dr. Nylander's paper in the "Flora" reprinted in Grevillea."—W. Phillips and C. B. Plowright, "New and rare British Fungi" (tab. 24, 25, *Sphæria carbonaria*, n.s., *S. Winteri*, n.s.)

Monthly Microsc. Journal.—R. Braithwaite, "*Sphagnum fimbriatum*, Wils.; *S. strictum*, Lindb." (tab. 65, 66.)

Oesterr. Bot. Zeitschr.—J. Kerner, "*Hypericum elegans*, Stephan." —Id., "Botanical Notes."—Id., "Distribution of Hungarian plants" (contd.).—L. Treuinfels, "*Cirsium Benacense.*"—J. Dedecek, "Botanical Observations in 1873."—Val de Lievre, "Notes on *Ranunculaceæ*, &c" (contd.).—A. Oborny, "On the Flora of S. Moravia."—F. Sauter, "Moss-Flora of N. Tyrol."

Hedwigia.—J. Schroëter, "*Melampsorella*, a new genus of *Uredines.*" —A. Geheeb, "*Amblystegium Formianum*, s.n."

Flora.—L. Celakovsky, "On the Morphological Significance of Seed Buds" (ovules).—H. Müller. "Spore- and bud-origin of Mosses." —H. Wawra, "On Flora of Hawaii Islands" (*Rubiaceæ*, *Kadia* 4 new species).—L. Dippel, "On Structure of Cell-wall in *Pinus sylvestris.*" —J. Wiesner, "Remarks on Alleged Constituents of Chlorophyll."— K. Müller, "Indian Species of *Dissodon*" (2 new species.)

Bot. Zeitung.—H. Solms-Laubach, "On the Structure of the Seed of *Rafflesiaceæ* and *Hydnoraceæ*" (concluded).—H. Conwentz, "On the action of Camphor and similar powerful Agents on the Life of Plant-cells."

New Books.—H. W. Buek, "Index ad De Candolle Prodromum; Pars IV." (Completing the work. Hamburg, 16s.).—Willkomm, and Lange, "Prodromus Floræ Hispanicæ"; vol. iii., pars 1. Umbelliferæ—Rosaceæ (part) (Stuttgart, 10s. 6d.).—R. Brown, "Manual of Botany, Anatomical and Physiological." (Blackwood, 12s. 6d.)

The last published part of the Linnean Society's Transactions (vol. xxx., pt. 1) contains Mr. John Scott's Notes on the Ferns of British Sikkim, with 18 plates, and Prof. Reichenbach's Enumeration of the Orchids collected by the Rev. C. Parish in Moulmein with 6 plates.

The seventh century of Mr. Cooke's "Fungi Britannici" is published. *Cucurbitaria Euonymi* and *Phoma Lonicera* are new species. We are informed that this volume is the last of the series, and that a new series will follow in which some improvements will be introduced. The page will be a quarto instead of octavo, and figures of the spores or sporidia will accompany each species.

We call our readers' attention to a valuable paper on the Lichen-gonidia question in the current number of the "Popular Science Review," from the pen of the Rev. J. M. Crombie; the summing up of the evidence by the author is strongly adverse to Schwendener's hypothesis.

Mr. S. Kurz gives a third portion of his new Burmese plants in the Journ. Asiatic Soc. of Bengal, for 1873, part 2. *Citrus angulatus*, Willd., is the type of a new genus *Gonocitrus* and *Blumeodendron*, gen. nov., is founded on *Mallotus Fokbrai*, Muell. Arg. *Phyllocyclus* is a new genus of *Gentianeæ*, and *Balanostieblus* of *Urticaceæ*. There are two plates.

A member of the English Clergy, well-known for his botanical zeal died at Winchester on June 28th. The Rev. Charles Alexander Johns was born in 1812, and graduated at Trinity College, Dublin, in 1841. He held the curacy of Yarnscombe, Devon, for two years, and in 1844 became head master of Helston Grammar School, Cornwall, and subsequently master of the Grammar School at Dulwich. He early commenced to take interest in indigenous botany, and in 1836 became a Fellow of the Linnean Society. During his residence at Helston, he discovered *Trifolium strictum* to be a British species; his "Week at the Lizard," of which a second edition was issued a little before his death, gives an excellent account of the botany of that interesting district. Mr. Johns was a thorough naturalist and has published a number of elementary, educational and popular works on different branches of Natural Science; "Flowers of the Field" published under the auspices of the Christian Knowledge Society, in 1865, is in all respects an excellent elementary British Flora, and his other writings are clear, simple and truthful. After his removal to Winchester, Mr. Johns took a prominent part in founding the Hants Scientific and Literary Society, of which he became president and in which he continued to be actively interested till the close of his life.

The death has been recently announced of the Contessa di San Giorgio, formerly Lady Harley, whose book on Plant-names we noticed a short time since.

Original Articles.

ON *PTYCHOGRAPHA*, *Nyl.*, A NEW GENUS OF LICHENS.

By the Rev. J. M. Crombie, F.L.S.

(Tab. 150.)

The occurrence of a *new genus* amongst the many new species and varieties that are yearly being added to our British Lichen-Flora, is of sufficient interest to render a short notice of it desirable. There are indeed but few tribes in which, in so far at least as Great Britain is concerned, we could expect to meet with any new genera in the Nylanderian acceptation of the term, and those which have been discovered in our islands during the last ten years, are just in the tribes where their occurrence might have been anticipated, viz., in the *Collemei*, the *Pyrenocarpei* and the *Graphidei*. To the last of these, as may readily be inferred from its name, belongs the genus *Ptychographa*, which seems to be sufficiently distinguished by the following characters from all the allied genera of the tribe.

Ptychographa, *Nyl.*, gen. nov.

Thallus effuse, macular. Apothecia parallel, prominent, with 2 or 4 longitudinal hymenia in each; spores 8næ, simple, colourless; hymenial gelatine wine-red with iodine.

The systematic place of this genus is immediately after *Xylographa*, which at first sight it closely resembles. From this, however, as well as from all the other *Graphidei*, it is well recognised by the above arrangement of the hymenia, which renders the apothecia above twice or four times sulcatulate. The species by which as yet it is represented is—

1. *P. xylographoides*, Nyl., in Flora, 1874, p. 315. Thallus effuse, macular, greyish-white, internally with the gonidia subglomerated. Apothecia black, lanceolate, prominent, above somewhat plane, the epithecium longitudinally 1 or 3-plicated, within concolorous; spores 8næ, colourless, ellipsoid, simple, 0.011-14 mm. long, 0.006-7 mm. thick, epithecium nearly colourless, hypothecium and perithecium black.

The thallus spreads itself extensively over the substratum in the same manner as that of *Xylographa parallela*, of which, when gathered and on a mere cursory inspection, it was supposed to be merely a condition with the apothecia as in var. *pallens* f. *elliptica*, Nyl., though differing in colour. On subsequent and more close examination, however, it was seen to be in the character of the epithecium, &c., as above noted, very distinct from that or any other species of *Xylographa*, and on sending a specimen to Nylander for his opinion, he pronounced it to be "a very interesting discovery," and named it as above. Probably other species of the genus may yet be detected in N. Europe, by which it may be still further illustrated. In the few specimens gathered, for (not considering it distinct from *Xylographa parallela*, as already intimated) I only carried off a single portion of the substratum; the spores are but rarely seen well developed, in consequence of most of the apothecia, which are very numerous, being too old.

Hab.—On decorticated trunks of *Pyrus Aucuparia* in moist shady places of Craig Calliach, Braedalbane (Crombie, August, 1874).

EXPLANATION OF TAB. 150.

Fig. 1, *Ptychographa xylographoides*, Nyl., specimens in situ from Braedalbane, natural size; 2, Apothecia (in a dry state) magnified 25 diameters; 3, Thin transverse section of apothecium immersed in water, magnified 30 diameters; 4, A fragment of section of apothecium, magnified about 350 diameters; 5, The same treated with a solution of iodine; 6, Free spores; and 7, Gonidia, magnified 350 diameters.

ON A SMALL COLLECTION OF PLANTS FROM KIUKIANG.

BY H. F. HANCE, PH.D., ETC.

THE few plants of which a list is subjoined were all gathered on two consecutive days—the 2nd and 3rd August, 1873—by Dr. Otto von Moellendorff, of the Imperial German Legation at Peking, on the hills lying immediately to the south of Kiukiang. This city, one of those opened to foreign commerce by the Treaty of 1858, is situated in the province of Kiangsi, on the south bank of the river Yangtz', close to the outlet, at its northern extremity, of the great Poyang lake, in lat. 29° 54' N., and long. 116° 04' 30" E., and about 240 miles in a direct line from the nearest point of the seaboard.

Whilst M. Maximowicz's excellent and very complete "Index Floræ Pekinensis" provides a good catalogue of the Flora of the Chinese metropolis and its vicinity, and Mr. Bentham's classical "Flora Hongkongensis" has acquainted us with the principal constituents of that of the extreme S.E. of the empire, nothing whatever of a scientific character, has as yet, to my knowledge,* been written on the vegetation of the districts intermediate to these two points—which are separated by seventeen degrees of latitude—or of the various ports of trade along the coast or on the Yangtz'. I imagine, therefore, that no apology is necessary for the following very brief enumeration. And, small as is the collection, it is of considerable interest as a contribution to phytogeography, not merely from comprising a few novelties, but also because it exhibits several species hitherto found either in the mountainous regions of India alone, or also in Japan and the island of Formosa, but not on the Chinese main land, and thus bridges over the gulf in their eastward distribution. The most interesting plants are a puzzling *Asteracea*, and the new *Anaphalis*, which belongs to a group only represented in the extreme East by the Atlantic-American, Japanese and Manchurian *A. margaritacea*, Benth.

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* I should except a valuable list of Formosa plants supplied by Sir W. J. Hooker to Mr. Swinhoe, to whom I am obliged for a printed copy; but whether it be published or not I am unable to say. The late Prof. Miquel's "Prolusio Floræ Japonicæ" also contains a considerable number of Formosa plants collected by Oldham.

I have spared no pains to insure accuracy in the determinations; and have omitted four or five plants, either not in flower, or in so imperfect a state that it was impossible to make them out properly.

Clematis (*Flammula*) *tenuiflora*, DC.—Common in various parts of South China, but I have not before seen it from so far north.

Bocconia cordata, Willd.

Lychnis (*Eulychnis*) *grandiflora*, Jacq.—I do not know whether this has been found wild before: Loureiro mentions it only as in cultivation at Canton, where I have not seen it. Siebold supposes it to have been introduced from China into Japan, where, however, in the island of Nippon, Tschonoski gathered the too closely allied *L. Sieboldi*, v. Houtte.

Hypericum (*Euhypericum*, *Holosepalum*) *attenuatum*, Choisy.

Hypericum (*Brathys*) *japonicum*, Thunb.

Boenninghausenia albiflora, Rchb.—Now first recorded from China; only previously known from the mountains of India and from Japan.

Desmodium (*Heteroloma*, *Podocarpia*) *Oldhami*, Oliv.—This plant has only been found previously (whether in Japan or the Korean archipelago is uncertain) by the late Mr. Oldham. The foliage is somewhat clammy like that of *Glycyrrhiza*, and the hairs with which the plant is clothed are minutely hooked at the apex. I have seen no authentic specimens, but it agrees perfectly with Professor Oliver's diagnosis (Journ. Linn. Soc., Bot., ix., 165). Vieillard's New Caledonian *D. tinctorium*, which also belongs to this section, has pinnate leaves, but is otherwise very different.

Desmodium.—A species belonging seemingly to the section *Dollinera*, with very shallow obtuse calyx-lobes. It has somewhat the aspect of *D. oxyphyllum*, DC., but is entirely smooth, with ovate rhomboid leaflets reticulate beneath, the veins somewhat coloured, and loose subpaniculate small flowered racemes. I have little doubt it is new, but I do not venture to describe it from my solitary specimen, which is not in fruit.

Vicia (*Oroboides*) *unijuga*, Al. Br.—A form very peculiar in appearance, with a zigzag stem, thin papyraceous very acuminate leaflets, and sessile racemes, and looking so unlike the usual plant from N. China, that I at first felt sure it was a distinct species; but it is connected through Albrecht's Hakodate specimens. It has not the elongated lower calyx-tooth attributed to Maximowicz's variety *apoda* (Mél. Biolog. Bull. Acad. St. Pétersb., ix., 65), with which it agrees in inflorescence.

Pueraria Thunbergiana, Benth.

RUBUS (*Suffruticosi*, *Moluccani*) PACIFICUS, *sp. nov.*—Inermis, ramulis subteretibus cum petiolis pubescentibus, foliis coriaceis 3½ poll. longis petiolo 2½ pollicari cordatis acuminatis repandulis v. obsolete lobulatis irregulariter serratis supra glaberrimis subopacis subtus lacunosoreticulatis tomento sericeo gilvo-cinerascenti denso obtectis nervis rufescentibus, stipulis bracteisque (deciduis), pedunculis oppositifoliis bifloris, calycis laciniis extus ? dense cinereo pannosis oblongis obtusis intus glaberrimis peracta anthesi arcte reflexis.

From the diagnosis, this seems nearest *R. tiliaceus*, Sm., which I have not seen.

RUBUS (*Suffruticosi, Moluccani*) TEPHRODES, *sp. nov.*—Ramulis subteretibus petiolisque dense cinereo tomentosis aculeis sparsis recurvulis munitis aciculis setisque parvis glanduligeris dense consitis, foliis membranaceis brevipetiolatis e basi cordata subrotundis acutis 5-7 angulato-sublobatis denticulatis supra opacis sparsim pilosulis subtus dense cinereo-incanis venis elevatis concoloribus reticulatis primariis tantum setulosis, stipulis bracteis bracteolisque pectinatis, thyrsis ad ramulorum apices axillaribus 1-3nis multifloris folia superantibus, pedicellis floribus æquilongis cum calycibus pedunculoque cinereo-villosis setigerisque.

Appears to be allied to *R. elongatus*, Sm.: I have a close relative of this and of *R. paniculatus*, Sm., from Kwangsi, gathered by the Rev. Dr. Graves. These two Brambles are quite distinct from any of the Chinese and Japanese species of the section I have hitherto seen, and from all other Asiatic ones in my herbarium. In his revision of the Japanese *Rubi* (Mél. Biolog. Bull. Acad. St. Pétersb., viii., 380) M. Maximowicz—to whom I am indebted for beautiful specimens of nearly all the species—has reduced my Fokien *R. althæoides* (he has misquoted the name as *R. althæifolius*) to *R. corchorifolius*, L. fil. This is an error; *R. palmatus*, Thunb., is the nearest in affinity to my plant, which is no doubt a perfectly good species.

Agrimonia viscidula, Bge.

Hydrangea (*Euhydrangea, Petalanthæ*) *Moellendorffii*, Hance.

Pileostegia viburnoides, Hook. f. & Thoms.—Only known heretofore from the Khasia mountains, and from Formosa, where the late Mr. Oldham gathered it. The present specimen accords well with Mr. Fitch's figure (Journ. Linn. Soc. Bot., ii., t. 2).

Sedum drymarioides, Hance.—Appears to extend throughout the east of China, from north to south.

Circæa mollis, S. & Z.—From the tomentum and short fruit-stalks, the specimen appears referable rather to this species than to *C. lutetiana*, Linn.

Begonia sinensis, A. DC.—Course of the nerves conspicuously marked with purple beneath, and leaves not more heartshaped than in *B. Evansiana*, Andr., but they are very much thinner, and the plant is less robust. But may not the latter be a "filia hortorum"?

Sanicula chinensis, Bge.—Certainly identical with Maximowicz's and Albrecht's Japanese specimens, and perhaps the same as the Indian *S. elata*, Ham., to which Miquel refers it. This latter is reduced to *S. europæa*, Linn., by Dr. Thwaites, Mr. Bentham (from the area assigned to the species in the "Handbook of the British Flora"), and was so by Dr. Hooker; but the distribution given to that species in the "Students' Flora of the British Islands" indicates a change of opinion on his part. In habit the Chinese plant differs considerably from the British one.

Sambucus chinensis, Lindl.—Occurs in the neighbourhood of

Canton, and also in Japan; for the plant distinguished by Maximonicz and Miquel under the name of *S. Thunbergiana*, Reinw., differs in no respect. See my remarks on the erroneous character attributed to this species in De Candolle's Prodromus (Ann. Sc. Nat., 5 sér. v., 217), which has probably prevented its recognition.

Pæderia fœtida, Linn.

Patrinia (Eupatrinia) heterophylla, Bge.

ANAPHALIS SINICA, *sp. nov.*—Caule herbaceo erecto ramoso tomento flocoso viridulo-candicante vestito, foliis sessilibus lanceolato-oblongis calloso-mucronatis utrinque dense tomentosis adultis supra plus minus calvescentibus 1⅓-2½ poll. longis 3-7 lin. latis, capitulis ad apices ramulorum aggregatis in corymbum compositum laxiusculum digestis, involucri squamis oblongis obtusis niveis 1⅓ linealibus.

A lovely little plant, in foliage much like *A. triplinervis*, Benth., but with the capitula of *A. contorta*, Benth., only arranged in a far less compact inflorescence.

There is, besides, a very curious *Asteracea*, with Senecioid styles and Inuloid anthers (likewise found by Mr. Sampson in Kwangtung province), which Mr. Bentham, the profoundest of living Synantherologists, believes to be the type of a new genus. This is left for further study.

Platycodon grandiflorus,* A.DC.

Lysimachia (Ephemerum) Fortunei, Maxim.

Siphonostegia chinensis, Benth.

Justicia (Gendarussa) Championi, T. And.

Peristrophe tinctoria, N. ab E.—I do not think this has been before recorded as a native of China: it is not so mentioned by Dr. Anderson. (Journ. Linn. Soc., Bot., ix., 521)

Eranthemum ?.—A bad specimen, apparently belonging to this genus, and perhaps an ally of *E. crenulatum*, Wall.

Phryma leptostachya, Linn.

Eritrichium (Endogonia) pedunculare, A.DC.

Salvia (Notiosphace) Fortunei, Benth.

Polygonum (Persicaria) filiforme, Thunb.—Only previously known from Japan. Differs considerably from Maximowicz's Yokuhama plant, the leaves being much thicker, and strigosely hairy on both surfaces, the stout primary veins strongly prominent beneath; whilst, except at the very base, the flowers are crowded on the spikes, which have therefore a much thicker appearance.

Elatostema.—Probably an undescribed species, allied to *E. Hookerianum*, Wedd., but with larger leaves. I have only the extremity of the plant, with six or seven clusters of male inflorescence.

Boehmeria platyphylla, Don, var. *tricuspis*, mihi.—Foliis (7-9 cent. longis 5-7 cent. latis petiolo subbicentimetrali) utrinque molliter hispidis orbiculari-semiovatis ima basi integris grosse increscenti-dentato-serratis apice usque ad tertiam limbi longitudinis partem et ultra trisectis lobo intermedio oblongo-lanceolato laterales intus curvato-excisos vix superante, spicis masculis ramosis densis.

A very singular variety, nearest to Weddell's *ρ. macrophylla* (= *γ. japonica*, in part, of his first monograph).

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* Κώδων is masculine, not neuter, as written in the Prodromus.

Of already described *Urticaceæ* which Dr. Weddell has omitted to record as natives of China, in his latest recension of the order, I possess the following:— *Urtica cannabina*, Linn., Chihli, towards Mongolia. *Pilea peploides*, Hook. & Arn., Formosa; with the upper half of the leaf margins crenulate, as in the variety *major*. *Pilea pumila*, A. Gr., Jehol. I do not see how *P. mongolica*, Wedd., differs from this, which was long ago recorded from Manchuria by Maximowicz and Regel. *Pellionia Grijsii*, Hance, Fokien. Entirely overlooked in the Prodromus. *Boehmeria platyphylla*, Don, *θ. scabrella*, Wedd., Kwangtung. *Villebrunea frutescens*, Bl., Kwangtung. Already mentioned in the "Flora Hongkongensis," but no reference to China in the Prodromus.

Castanea vulgaris, Lam., *ε japonica*, A.DC.

Cephalotaxus Fortunei, Hook.

Pardanthus chinensis, Ker.

Lycoris aurea, Herb.

Lycoris radiata, Herb.—That Miquel's *Nerine japonica* is different from this may be inferred from the circumstance of his recording both from Japan; but a plant received from M. Maximowicz under that name seems quite the same. I have carefully studied living specimens of the Chinese species, raised from wild bulbs collected in Kwangsi by the Rev. J. R. Graves, M.D., and it accords in all respects with Kunth's detailed character. (Enum. Plant., v., 546.)

Lilium longiflorum, Thunb.

Lilium speciosum, Thunb. *a. Kæmpferi*, Sieb.—I am not aware that this beautiful plant, which Siebold believed to have been introduced into Japan from Korea, has heretofore been met with wild in China. It is a great favourite in Europe; and M. Spae (Mém. s. l. espèces d. genre Lis, p. 38) expresses a hope that an accomplished horticulturist he names will succeed in producing varieties "qui s'éloigneront totalement, quant à la forme, de leur type"! The passion for ultra-hybridised races is unfortunately (from a botanist's point of view) so strong that it is nowadays almost impossible to determine accurately plants under cultivation. He who attempts the task finds, as Charles Lamb said when teaching a young lady Latin, that "Sisyphus! his labours were as nothing to it."

Ophiopogon spicatus, Ker.

Commelyna communis, Linn.

Panicum (Virgaria) mandshuricum, Maxim.

Eulalia japonica, Trin.

Androscepia gigantea, Brongn.

Gymnogramme (Coniogramme) japonica, Desv.—This very elegant fern had not previously been found on the Chinese continent.

Lindsaya (Odontosoria) tenuifolia, Mett.—Mettenius subsequently changed the name to *L. chinensis*, because it is said to be Linnæus' *Trichomanes chinensis*. Although there is an older *Lindsaya tenuifolia*, Bl., and the synonymy requires clearing up, I have not adopted the change, because this is certainly Swartz's *Davallia tenuifolia;* and the fern named by him and Smith *Davallia chinensis*, though not specifically distinct, is so well marked that I find it very difficult to convince collectors here that it is not a true species.

Pteris aquilina, Linn.

Woodwardia japonica, Sw.

Asplenium Oldhami, Hance ?—Apparently belonging to this obscure species, but almost runs into *A. furcatum*, Thunb. With the exception, perhaps, of *Acrostichum*, there is no genus the species of which are so perplexing and inextricable as those of *Asplenium*, and this is especially the case with the *furcatum* group. My *A. comptum*, recognised as a true species by Mettenius and Kuhn, but referred to *A. dimidiatum* by Mr. Baker, would, if the pinnæ became laciniated, be scarcely distinguishable from *A. furcatum;* and many other species seem either altogether unstable, or almost impossible to characterise with any precision.

Asplenium lanceum, Thunb.

Aspidium falcatum, Sw.

Aspidium erythrosorum, Eaton.—I have stated elsewhere my conviction that neither this nor *A. varium*, Sw., are specifically distinct from *A. Filix-mas*, Sw.

Aspidium aristatum, Sw.

Aspidium coniifolium, Wall.—United with the preceding by T. Moore, Mettenius, Sir W. Hooker, and Baker. It is, however, perfectly constant to its characters, and I cannot think but that it is distinct. In this view, and against so formidable a phalanx of opposing pteridologists, I am happy to find myself supported by the high authority of Dr. Thwaites.

Aspidium Boryanum, Willd.—Found in Bourbon, the mountains of the Indian continent, and Java, but not previously collected in China. Agrees well with a Mishmi specimen of Griffith's in my herbarium.

Aspidium decursive-pinnatum, Kze.

Aspidium glanduligerum, Kze.—The Polynesian fern, inadvertently named *A. glanduliferum* by the late Prof. Mettenius (Kuhn in Verhandl. d. k.k. Zool.-Bot. Gesellsch. in Wien, 1869, p. 577), will have to be re-baptised.

Gleichenia dichotoma, Hook.

Lygodium flexuosum, Sw. ?—Similar to a Philippine Island specimen in my herbarium. I do not profess to understand the species of this very difficult genus, and their circumscription and synonymy are very differently given by Mr. Baker in the "Synopsis Filicum," and by Dr. Kuhn (Miquel Ann. Mus. Bot. Lugd.-Bat., iv., 297).

Selaginella flabellata, Spring.

ON THREE NEW CHINESE *CALAMI*.

BY H. F. HANCE, PH.D., ETC.

MR. BENTHAM stated in the "Flora Hongkongensis," on my authority, that there are three *Calami* natives of the island. Of these, though one is very abundant, (and I formerly possessed its fruit, burnt at the destruction of the foreign factories at Canton, in December, 1856), I had long endeavoured unsuccessfully to obtain specimens. Last year, however, Capt. Walker, of H. M. 99th Regiment, Brigade Major, a most energetic explorer, was so kind as to interest himself on my behalf, and towards the close of the summer he sent me a fine fruiting specimen of one species; whilst some months later, another friend forwarded me similar examples of a second, and quite recently of a third one. Early in the present year, while on a visit to Hongkong, I examined two of these plants in their native localities, and was enabled to make some notes in the field. I have found the determination of these Palms a far more difficult task than I had anticipated, owing to the numerous species described, the imperfection in many cases of the descriptions given, the want of uniformity in the characters drawn up by various authors, and the deficiency of authentic specimens in my own herbarium.

Amongst the older writers, Rumphius,* in his noble "Herbarium Amboinense," figures eight species; but, though his plates are nearly always faithful, and indeed often admirable, in the present instance, from the absence of any analyses, these "icones laudabiles," as Sprengel styles them, are quite insufficient for identification. Loureiro's diagnoses† of six Cochin-Chinese Rattans are worthless; and if his plants are ever made out, it can only be by means of the native names he has furnished. Roxburgh‡ drew up brief and insufficient characters of fifteen species indigenous to or cultivated in India, with tentative, and probably in the main erroneous, identifications with those described by the Dutch naturalist. A large number of Indian species, including those collected by the late Mr. Griffith, were described and figured by Prof. von Martius, in his "Genera et Species Palmarum"; but it is almost needless to say that this costly work is inaccessible to me where I am writing. Many *Calami* are elaborately described, and roughly though no doubt correctly figured, in Griffith's "Palms of British India," a work which, in common with his other scientific *reliquiæ*, has greatly suffered from discreditably careless editing. In his sumptuous book "Rumphia," the late Prof. Blume fully described a considerable proportion of the species inhabiting the Malayan archipelago, and illustrated them by the most exquisite plates. These, with the addition of most of the Indian Rattans, have been conveniently brought together and systematically grouped by Miquel, in the third volume of his "Flora Indiæ Batavæ," which is certainly the most useful manual for the study of the Asiatic species. Since then, Dr. Thwaites has characterised three new *Calami* from Ceylon§; and the late Dr. T. Anderson three from Sikkim.‖

With these *subsidia literaria* only at my disposal, I have done my best to make a careful study of three Hongkong Rattans, the male inflorescence of all of which is unfortunately still unknown; and the result I have arrived at is that they are distinct from all the Indian or

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* Herb. Amboin., v. 97—119., t. 51—58.

† Fl. Cochinchin., ed. Willd., i., 260. sqq.

‡ Fl. Indica, iii., 773. sqq.

§ Enum. pl. Zeyl. 431. Amongst the indigenous species, Dr. Thwaites refers one to *C. rudentum*, Lour., with *Palmijuncus albus*, Rumph. as a synonym. But Rumphius' species (*C. albus*, Pers.) has not, up to this day, been made out by the Dutch oriental naturalists, Loureiro's is equally unknown, and the identity of the two is altogether problematical; whilst there is no evidence that Roxburgh's *C. rudentus* (sic!) belongs to either.

‖ Journ. Linn. Soc. Bot., vi., 9—11.

Malayan species described, one being apparently quite isolated in regard to relationship. Nor is this an unexpected conclusion: Hongkong is far distant from the focus of the genus, and has a very different vegetation; of the seven species recorded from Ceylon, so close to the Indian continent, three are said to be endemic; and concerning those of "India aquosa," Blume writes*:—"Pleræque species longe angustioribus terminis circumscriptæ sunt quam vulgo creditur. Ex nostro quidem opere intelligitur ut omnes Asiæ continentis species, nulla fere excepta, a Javanis revera differunt, ita has rursus ab illis quæ Moluccas incolunt esse diversas, quinetiam singulis fere insulis vasti Archipelagi indici suas esse species, atque adeo inexhaustas esse naturæ harum palmarum viminearum divitias." One of them is a *Dæmonorops*, a group surely of no more than sectional value,† the other two are true *Calami*, and belong to Griffith's *Coleospathæ*, the first to the division α. *erectæ*, *eflagelliferæ*, the second, I presume, to β. *scandentes*, *petiolis eflagelliferis*.‡ I have followed Von Martius' arrangement; but am disposed to believe that the circumscription of primary groups mainly or exclusively by the presence or absence of *lora* and *cirrhi*, however convenient for purposes of classification, may have the practical effect of separating species really closely allied, and is at the best but an artificial expedient.

1. Calamus (*Eucalamus*, *Anuri*) thysanolepis, *sp. nov.*.—Stans, acaulis, frondibus petiolatis 2½-3½ pedalibus ecirrhiferis segmentis in fasciculos 12-15 oppositos v. subalternos intervallo 2-3 pollicum sejunctos quovis fasciculo e phyllis 2-6 conflato digestis, petiolo inferne subtereti-complanato superne triquetro flaventi-viridi aculeis validis rectis sparsis dimidio inferiore petiolo concoloribus a medio ad apicem nigris subtus armato, segmentis decrescentibus flaventi-viridibus ensiformibus acuminatis 4-15 poll. longis 6-8 lin. latis margine et facie superiore secus costam nervosque binos margini subapproximatos reliquis paulo magis conspicuos et subprominulos aculeolis distantibus obsitis, spadicis feminei ecirrhosi decompositi spathis primariis cum

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* Rumphia, iii., 30.

† Blume himself (Rumphia, iii., 29.) allows that it is but a subgenus; whilst Miquel, though he afterwards admitted it, wrote, under a happier inspiration:—"Genus *Dæmonorops*, characteribus nimis levibus innixum, cum *Calamo* conjungendum est. Sectionem potius ejus generis quam subgenus mihi constituere videtur." (Analect. bot. ind., i., 6.) Griffith, who was essentially a philosophical naturalist, united the two without any remark. Miquel's inconsistency in subsequently distinguishing *Dæmonorops* is remarkable, because there is in reality no character save the ruminated albumen to support this view, and this varies in degree in the different species; whilst in *Calamus* it is always more or less erose or tubercular on the surface, and sometimes, (*e.g.* in *C. melanoloma*, Mart.) perforated, *i.e.*, imperfectly ruminated. Yet, while in this instance assigning to a variable character generic rank, he combines under *Ptychosperma* species with both ruminated and uninterrupted albumen. To me there seems abundant reason for concluding that ruminated albumen is a character of very little importance in Palms; neverless, both M. Brongniart (Ann. sc. nat. 5e. sér., ii., 158.) and Dr. Scheffer (in a valuable memoir "Sur quelques Palmiers du groupe des Arécinées," published in the 12th vol. of the Natuurkund. Tijdschr. v. Ned. Indie.) attach primary value to it. On the other hand, Dr. Hooker (Fl. Nov. Zeland., i., 261.) combines *Kentia* with *Areca*, though the 1-celled ovary is opposed to the reduction.

‡ Palms of Brit. India, 35.

pedunculo inermibus laxis extus furfuraceo-glandulosis in fibras facile solutis, ramis primariis circ. 6 spathæ subæquilongis recurvis tomento fulvo derasili obtectis inferne compositis superne simplicibus crassis flexuosis, ramulis tetragonis densifloris subbipollicaribus spathellis membranaceis laxis acuminatis fultis, bracteis ovatis acuminatis fibroso-nervosis; fructus ellipsoidei conspicue umbonati 6 lin. longi orthostichis 18 singulo e squamis 12-14 (inclusis summis depauperatis) conflato, squamis esulcatis fulvo-flaventibus acumen versus rufo-brunneis margine eleganter fimbriato-ciliatis, seminibus subcompresso-ellipsoideis, albumine extus subtuberculato intus latere chalazam spectante conspicue excavato æquabili, embryone exacte basilari.

Juxta fontes rivi ad Taitamtuk, ins. Hongkong, sub initio mensis Novembris 1873, legit Dr. G. Dods. (Herb. propr., n. 18373.)

This, which seems uncommon, for I only know about half a dozen plants on the island, is apparently without near relations. I am not aware that any other species of this section is known with clustered frond-segments. *C. fasciculatus*, Roxb., and a few others distinguished by this character belong either to the *Loriferi* or the *Cirrhiferi*. The fruit, if wounded, exudes a juice which hardens into a transparent red Dragon's-blood.

2. CALAMUS (*Eucalamus*, *Loriferi*) WALKERI, *sp. nov.*—Frondibus petiolatis 3-4 pedalibus ecirrhosis, petiolo inferne rotundato-complanato superne triquetro spinis validis rectis v. recurvis quandoque pollicaribus apice nigrescentibus subtus armato, segmentis 30-40 jugis decrescentibus suboppositis intervallo circ. pollicari separatis flaventi-viridibus ensiformibus acuminatis 8-20 poll. longis 6-12 lin. latis terminali sæpe ultra medium bifido supra costa nervisque duobus reliquis paulo validioribus ei et marginibus fere intermediis aculeolis distantibus setiformibus obsitis aculeolisque paucis nunc in pagina inferiori occurentibus, spadicis feminei in lorum elongatum dorso spinis semiverticillatis in cupulam connatis horridum producti decompositi spathis primariis cum petiolo aculeatis haud inflatis acutis præter marginem apicalem dense et grosse setoso-ciliatum glabris, ramis primariis 2-4 spatham multum superantibus flexuosis erectis subglabris ramulos circ. 40 divaricatos densifloros satis tenues 1-2 pollicares proferentibus, spathellis laxis rigide membranaceis margine ciliatis, bracteis præter molem minorem spathellis conformibus, ovariis stigmatibus papillosis crassis divergentibus coronatis, fructus ovoidei stigmatum basi apiculati 5 lin. longi orthostichis 18 singulo e squamis 8-10 (summis imperfectis computatis) esulcatis eburneo-stramineis æqualiter et anguste fusco-marginatis composito, seminibus compressis, albumine extus grosse gyroso-tuberculato intus æquabili ad chalazam non excavato, embryone exacte basilari.

In insula Hongkong, m. Augusto 1873, fructiferum legit centurio A. L. Walker. (Herb. propr. n. 18225.)

Not uncommon in several parts of the island, according to its discoverer. The nearest relatives of this plant appear to be *C. viminalis*, Willd. and cognate species.

3. CALAMUS (*Dæmonorops*, *Cymbospathæ*) MARGARITÆ, *sp. nov.*—Caudice primum erecto dein vagante 15-pedali et ultra basi diametro 3-pollicari aculeis atro-fuscis rectis complanatis pollicaribus deflexis spiraliter zonatim dispositis aliisque acicularibus minoribus confertis

horrido, frondibus inter se intervallo 3-6 pollicum distantibus breviter petiolatis 6-10 pedalibus cirrhiferis, vaginis inferne incrassatis deorsum tumentibus aculeis complanatis armatis cum petiolorum basi indumento rufo furfuraceo deliquescente vestito, petiolo subtus rotundato parcius aculeato supra plano aculeis complanatis virentibus seriatis sæpiusque confluentibus obsesso, rachi subtus rotundata spinis recurvis apice nigricantibus cupulatim semiverticillatis horrida supra per dimidiam longitudinem complanata dein ad frondis apicem usque carinata spinis brevibus rectiusculis densiuscule obsita, segmentis 50-75 jugis suboppositis flaventi-viridibus ensiformibus acuminatis 12-18 poll. longis (mediis longioribus) 6-10 lin. latis supra costa nervisque duobus v. quatuor aculeis setiformibus præditis subtus margineque versus segmenti apicem aculeolis parvis obsitis, cirrho subtus spinis cupulatim connatis armato, spadicibus femineis solitariis subsessilibus erectis ramosis circ. 9 pollices longis, spathis membranaceis duabus tribusve exterioribus aculeis atrofuscis distantibus complanatis patenti-reflexis armatis cymbiformibus ventre apertis apice in rostrum acuminatum complanatum lamina triplo brevius productis interioribus inermibus planis, ramis glabris robustis flexuosis ancipiti-compressis, spathellis bracteisque late ovatis acuminatis, bracteolis in cupulam truncatam connexis, floribus distichis, calyce urceolato-campanulato fortiter striato-nervoso obsolete 3-dentato, corollæ laciniis lanceolatis acutiusculis calyce duplo longioribus, stylo crasso stigmatibus revolutis, fructibus juvenilibus ellipsoideis fusco-olivaceis maturis sphæricis stylo stigmatibusque persistentibus coronatis diametro 10-11 lineali, orthostichis 18-20 singulo e squamis 12-14 (imperfectis inclusis) medio conspicue sulcatis nitidulis fusco-stramineis margine bicolori extus scilicet albo intus fusco præditis composito, seminibus nephroideo-subglobosis, albumine extus ruguloso intus profunde ruminato, embryone subbasilari.

Ad latera collium vallem Wongneichung supereminentium, m. Aprili 1874, legit domina Margarita Dods, digni mariti dignissima conjux, ejusque in pererrationibus botanicis firma et indefessa comes, cujus nomine hanc *Calamorum* nostrorum præcipuam ornavi speciem. (Herb. prop. n. 18407.)

The commonest apparently of the Hongkong Rattans, growing in ravines, amongst rocks, by water-courses and rivulets, often gregariously. I believe its nearest ally to be *D. melanochaetes*, Bl., which, however, has stems upwards of 200 feet long, and differs in many particulars. Within the bract subtending each flower is either the aborted rudiment of a second female, or the scar of a fallen male one; which, the examination of young specimens can alone determine. The nut is scarcely distinguishable in flavour from that of *Areca Catechu*, Linn., and might be used as a substitute. Blume makes the same remark of his *D. calapparius*.

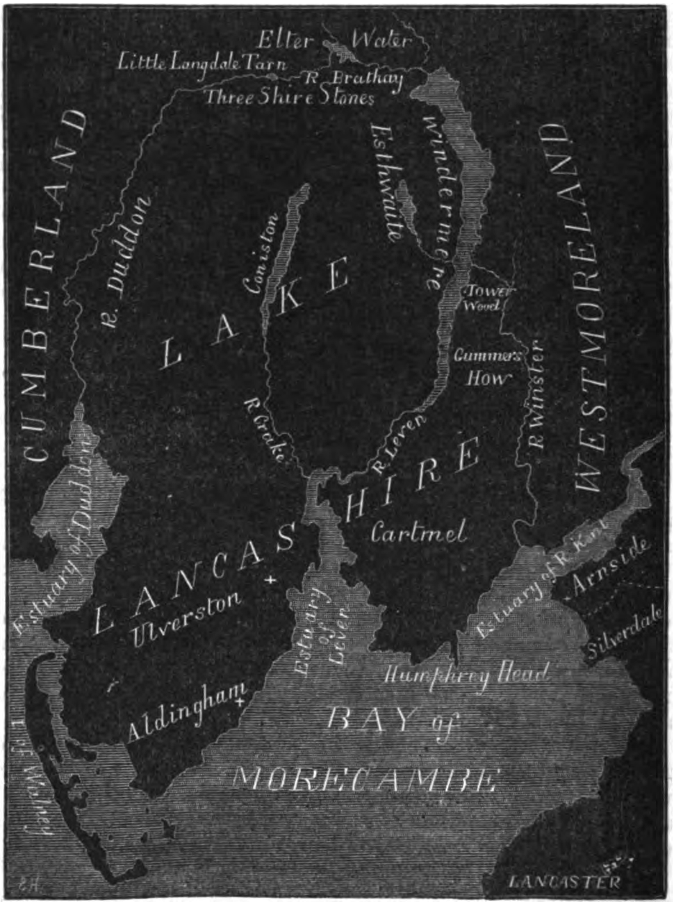
A fourth *Calamus* occurring in the island has short wide frond-segments, irregularly subfasciculate, and may be an ally of *C. gracilis*, Roxb.; but in this fine genus the foliage does not seem to afford any trustworthy clue to affinity. I hope I may procure specimens during the present year, but only two or three plants are known.

NORTH OR LAKE LANCASHIRE; A SKETCH OF ITS BOTANY, GEOLOGY, AND PHYSICAL GEOGRAPHY.

By Miss E. Hodgson.

[The following list of the plants of North or Lake Lancashire is not intended as a complete account of what is known of the botany of the district; it is simply a record of those noted therein by the writer. This it is important to bear in mind in consulting the paper; all previously printed matter is excluded, and *localities* already published are not repeated, each plant and locality standing on the personal authority of the author.—*Ed. Journ. Bot.*]

Introduction.—Lake Lancashire, North Lancashire or Lonsdale



north of the Sands,* is that part of the county which lies on the north-west of the Bay of Morecambe, and from which it has become widely separated during past centuries. That it was not wholly cut off in Camden's time seems probable from the words:—"I saw Forness, the other part of this county on the west, which is almost severed from it by the sea;" and again, "the shore once lay out a great way westward into the ocean."—*Gibson's Camd. Brit.* The tradition of a former land extension, watered by the rivers Leven and Crake, is well known; entire villages have been swept away, and the ancient church of Aldingham, which once stood in the centre of its parish, is now within spray reach of high tides.

Boundaries of Lake Lancashire.—The imaginary line dividing the main county from Westmoreland comes out on the shore between Silverdale and Arnside (see map), and crossing what is now the estuary of the river Kent, strikes northwards up the Winster to its rise, or nearly so; thence it takes an angle to the west, and enters Windermere four miles from the foot. Proceeding up the middle of that lake to the top, it emerges and runs westward by the river Brathay and Elter Water to the head of Little Langdale, and "the three shire stones," a point where the counties of Cumberland, Westmoreland, and Lancashire meet. Here, leaving Westmoreland, it now divides the county from Cumberland by following the course of the river Duddon to the sea.

The area thus almost insulated is about twenty-five miles from north to south, and thirteen from east to west. With the exception of the extreme south end, the ground has fine undulations of hill and moor, which towards the north rise into fells, whose culminating points are Caw, White Pike, Brown Pike, Walna Scar, The Old Man, and Wetherlam, with a varying altitude reaching to 878 yards. As regards the character of the scenery of Lake Lancashire, it is only in the more elevated sweep just mentioned that it at all assimilates to that of the grand region shared by the sister counties; but it possesses many miles of lake loveliness, which is scarcely surpassed by the rugged troughs of the mountains.

The principal water-courses are the rivers Leven and Crake; the former brings to the sea the superfluous waters of Windermere, the other those of Coniston. But the smaller streams called becks, afford better ground for the botanist, and these are numerous. The three lakes, Coniston, Esthwaite, and Windermere, are situated in nearly parallel valleys, running from north to south; the Esthwaite overflow is discharged into Windermere by means of Cunsey beck.

From the foot of Windermere up to Storrs, both sides are in Lancashire, including the hill Gummers How, abruptly rising 925 feet above the lake, and behind which is carried the old steep road over Cartmel-fell into Westmoreland, crossing the boundary at Bowland Bridge. A considerable tract of fine country is thus enclosed between the Winster and the Leven, elevated and woody, and which stretches away for twelve miles to the south, ending in the Cartmel promontory of Humphrey head; a sheer wall of limestone nearly two hundred feet above the sea at its base.

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* In conjunction with Cartmel, Furness forms that part of the Hundred o Lonsdale which is distinguished as Lonsdale North of the Sands. . . . . The county of Lancaster has been divided into two parts for making returns to Parliament. Furness by its natural locality belongs to what is called the northern division of the county, and contains two places for polling, Ulverston and Hawkshead.—"Furness and Furness Abbey," 1842.

Geology.—It is not in my power to give an accurate sketch of the geology of North Lancashire; that is at present in the hands of the Survey, and it will very likely have to be re-learnt by the amateur when their work is done.

The rocks all down the vale of the Duddon, those also along the course of the Brathay to the head of Windermere, those of all the higher peaks before noticed, belong to what are called by the earlier geologists the Green Slates and Porphyry, a series of igneous and aqueous interbedded rocks, with, in the igneous portion, very varying texture. Whether these, constituting as they do, such strikingly different scenery to that of strata of a younger age, really exert a correspondently different influence on plant-growth, is more than I have been able to discover. South of this tract, and reposing on the above strata, is a triple band, stretching, though somewhat faulted, in a north-east and south-west direction, from the head of Windermere to the estuary of the Duddon, comprising Coniston limestone, Coniston flags, and Coniston grits. These are for the most part hard rocks; but the lowest, the limestone, abounds with exquisitely beautiful fossils of great age. A considerable part of the remaining district is covered by a set of hard, thick silicious beds, called Lower Ludlow and Bannisdale slate. These extend from about a mile below Wray down the full length of Windermere to the Leven estuary, surrounding Esthwaite Water and two or three miles of the lower end of Coniston. Gummershow is in this group, also Cartmel fell, and except for the carboniferous limestones of Hampsfield fell, Grange, Kirkhead, and Humphrey head, which skirt the shore in places, it occupies Cartmel and the Bigland range of hills to the sea.

Numerous igneous dykes outcrop here and there through the last-named formation; but although of a mineral texture, and in places extremely soft, I have not noticed in connection therewith any greater or less fertility of soil. Reverting to the Coniston limestone, flags, and grits, these are repeated by means of much faulting, on the east side of the Duddon estuary (the last extending to the left bank of the Leven estuary), and from underneath which a strip of the Green Slate and Porphyry appears again in the remarkable crags of Greenscow and High Haume. The well-known old quarries of Kirkby Ireleth are in the Coniston flags division.

Immediately to the south-west and east of the town of Ulverston, the Carboniferous Limestone is the uppermost rock for six miles, with a breadth of four miles. Towards the shore it forms rugged ridges about four hundred feet in height. Its beds dip to the south-east; and along high-water-mark present fine glaciated pavements to the dash of the tides. Though smaller in extent, the limestones of Grange afford better botanical ground than these of Furness, being far less exposed to the cold west winds from the Irish Sea.

Highest in the sequence of North Lancashire rocks are the Upper Permian Sandstones of Hawcoat and the deep dell of Furness Abbey. These form the extreme south and south-west margin of the country underlying the thick drift, it is believed, out to the islands, none of which show rock on the surface.

Botany.—It is not pretended that the following list comprises anything like a complete Flora of this part of the Lakes Province, or that it wholly supplies what was left unpublished by former observers; but it may serve as a rather wider introduction to the district than has yet been given, and in that respect prove useful. I cannot say that any one part has been thoroughly searched; the higher altitudes especially may be considered as almost new ground, both the north-western and south-eastern slopes; the limestone tracts, too, and the rich soils of the Permian have been left nearly unvisited save by prior collectors: so that the question might well arise as to the expediency of publishing at all, when rarities and common plants are alike wanting to the list. It is, however, very satisfactory to state that, excepting Filices, the species have all been examined, corrected, or verified, and a portion wholly named, by Mr. Baker, assisted in part by the Rev. W. W. Newbould; and thus so far as it goes, the printed list may be taken as a reliable record. When it has been thought of any interest to note the elevation of a plant above the sea-line, it is derived from the Ordnance six inch maps and shown in feet.

The underlying rock is indicated thus:—

Gr. Sl. and Porph. for Green Slate and Porphyry.
Con. Lime. for Coniston Limestone.
Con. Flags for Coniston Flags.
Con. Grits for Coniston Grits.
Bann. Sl. for Bannisdale Slate.
M. Lime. for Carboniferous, or Mountain Limestone.
Perm. for Permian.

When no locality, altitude, or rock-formation is appended it is either because the species is believed to be common in the district, or that the only locality known for it is one already on record; the name, however, being reprinted, to show that the plant has been *recently* verified by an actual specimen, and its claim to the sub-province thus re-established.* In all cases, where I have been directed to a station hitherto unknown to me for a plant, the name of the obliging informant will be found in brackets.

The arrangement and nomenclature are mainly, though not entirely, those of the Lond. Cat. of Brit. Plants (sixth edition). For the disposal of the varieties of *Rosa canina*, Linn., I had recourse to Mr. Baker's monograph of the British Roses published by the Linnean Society. The arrangement of the forms of *Rubus fruticosus* is in accordance with that of the same author in the Student's Flora: and in *Ranunculus aquatilis*, Linn., the subspecies and vars. are intended to express the views of Mr. Baker so far as I could interpret them from his notes to my specimens; other deviations from the Lond. Cat. in favour of the above authorities also occur. Subspecies are indicated by a long line (——) and varieties by a short line (—) placed before the name.

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* The trouble of avoiding a repetition of previously printed localities has been much lessened by a kindly permitted reference to Mr. Baker's MS. compilation of book-records.

Clematis Vitalba, *Linn.* High Stott Park, east side of Windermere, apparently not long introduced there. 200. Bann. Sl.

Thalictrum minus, *Linn.*

—maritimum.

——flexuosum, *Bernh.* Foot of Windermere [Miss M. A. Ashburner.] Lowwood Bridge, River Leven.

Anemone nemorosa, *Linn.* Woods and river banks, frequent. Con. Flags, Bann. Sl., M. Lime.

Ranunculus aquatilis, *Linn.*

——peltatus, *Fries.* Gillbanks Beck, Ulverston; Windermere Lake, at Newby Bridge; swamp inner side of Biggar Dike, and other spots in the Isle of Walney already recorded.

—floribundus, *Bab.* Ditch-drains, Mansriggs, near Ulverston; Canal feeder, Ulverston.

——heterophyllus, *Fries.* Urswick Tarn; in a spring-pool, Plumpton, near Ulverston.

—pantothrix, *Auct.* Roadside ditches, Plumpton.

——trichophyllus, *Chaix.* Bardsea Mill-pond, near Ulverston; Urswick Tarn.

R. Lenormandi, *Schultz.* Plumpton peat-trenches.

R. ficaria, *Linn.*

R. flammula, *Linn.*

——pseudo-reptans. Urswick Tarn.

R. Lingua, *Linn.* Urswick Tarn. 100. M. Lime.

R. auricomus, *Linn.* Plumpton Woods, Ulverston. 100. M. Lime. Colton Beckwood. 25. Bann. Sl.

R. acris, *Linn.*

R. repens, *Linn.*

R. bulbosus, *Linn.*

R. hirsutus, *Curt.* Isle of Walney, on Biggar Bank. Perm.

R. sceleratus, *Linn.* Peat ditches, Ulverston. M. Lime.

Caltha palustris, *Linn.*

——minor. Seathwaite Tarn. 1210. Gr. Sl. and Porph. Walna Scar. 1500. Gr. Sl. and Porph.

Trollius europæus, *Linn.* Sides of rivers and becks. Gr. Sl. and Porph. Bann. Sl.

Helleborus viridis, *Linn.* Slack woods, Grange [Miss A. Butler.] M. Lime.

Aquilegia vulgaris, *Linn.* Rowdsey Wood; M. Lime. Near Dalton; M. Lime. Plumpton rocks, Ulverston shore, [white]; M. Lime.

Berberis vulgaris, *Linn.* Between Penny Bridge and Colton Beck Bridge, doubtfully wild. 150. Bann. Sl.

Nymphæa alba, *Linn.* Urswick Tarn. 100. M. Lime.

Nuphar lutea, *Sm.* Latterrigg Tarn, Woodland. 100. Con. Fl. [Mrs. Hart Jackson.]

Papaver Argemone, *Linn.* Furness shores at Roosebeck. Perm.

P. dubium, *Linn.* Furness shores at Roosebeck. Perm.

P. Rhæas, *Linn.* Fields, Salthouse, near Barrow. Perm.

Meconopsis cambrica, *Vig.* Near every hamlet in High Furness.

Chelidonium majus, *Linn.* Frequent near old gardens.

Glaucium luteum, *Scop.* On all the shores. M. Lime. Perm.

Corydalis claviculata, *DC.* Rowdsey Wood. 25. M. Lime. Bank End Wood, near the Duddon. [Mrs. Hodgson.] 200. Gr. Sl. and Por.

Fumaria capreolata, *Auct.*

——Boræi, *Jord.* Rosshead hedges, near Ulverston. 275. M. Lime. Bardsea, near shores. M. Lime. School lane, Isle of Walney. Perm.

——confusa, *Jord.* Rosshead hedges, near Ulverston. 270. M. Lime. Furness shores at Roosebeck. Perm. Friends meeting house, near Hawkshead. 225. Con. Gr.

F. officinalis, *Linn.*

Cakile maritima, *Scop.*

Crambe maritima, *Linn.* W. beach, Walney, at Tummerhill, and further south. Perm.

Capsella Bursa-pastoris, *DC.*

Iberis amara, *Linn.* Margin of Jacklands Tarn, Low Furness; garden escape.

Lepidium Smithii, *Hook.*

Cochlearia officinalis, *Linn.*

——vars. Ditch sides and marshes. Plumpton round to the Duddon.

——alpina, *Bab.* Ghylls on Dobby Shaw. Seathwaite Fells. 1250. Gr. Sl. and Porph.

Draba verna, *Linn.*

——brachycarpa, *E.B.* 3. From shore to top of Birkrigg, near Ulverston. 400: and wall tops in High Furness. M. Lime, Bann. Sl., Con. Gr.

Cardamine amara, *Linn.* Brook at the "Falls" farm, near Ulverston.

C. pratensis, *Linn.*

C. hirsuta, *Linn.*

——sylvatica, *Link.* Near Graythwaite, Windermere. 200. Bann. Sl.

Arabis Thaliana, *Linn.* Wall tops and hedge banks, frequent.

A. hirsuta, *Br.* Rocks at Plumpton; on the beach at Bardsea, and on rocks in Rowdsey Wood. M. Lime.

Barbarea vulgaris, *Br.*

B. præcox, Br.

Nasturtium officinale, *Br.*

Sisymbrium officinale, *Br.*

Erysimum Alliaria, *Linn.*

Brassica polymorpha, *Syme.*

——*Napus, Linn.* Stubblefields.

——*Rapa, Linn.* Inner slope of Biggar Dike, Isle of Walney.

Sinapis arvensis, *Linn.*

Reseda Luteola, *Linn.*

R. lutea, *Linn.* Near Ulverston, doubtfully wild. [Miss M. A. Ashburner.]

Helianthemum vulgare, *Gaert.* Rocky woods above Grange; near Dalton; Rowdsey wood and Humphrey head, M. Lime.

Viola palustris, *Linn.*, Plumpton peat moss, abundant.

V. odorata, *Linn.*

——violacea Fringing outer side of Plumpton woods walls; and on the beach below. Found also in other spots, but local. M. Lime.

——lilacina. Hedges near Ulverston, more rare. M. Lime.

——alba. Hedges near Ulverston. M. Lime.

V. hirta, *Linn.* Plumpton woods. M. Lime.

V. canina, "*Linn.*" Benth.

——sylvatica, *Fries.*

—Riviniana, Reich. Frequent.

—Reichenbachiana, *Bor.* About Newfield, Seathwaite, 300. Gr. Sl. and Porph. Cockley beck. 700. Gr. Sl. and Porph.

V. canina, "*Linn.*" Bab.

—flavicornis, *E.B.S.*

V. tricolor, *Linn.*

—arvensis, *Murr.*

Drosera rotundifolia, *Linn.* Common on bogs, 1200. Gr. Sl. and Porph.

D. intermedia, *Hayne*. Abundant on Plumpton and other low-lying moss-ditches.

Polygala vulgaris, *Linn*.

——depressa, *Wender*. Apparently the more frequent form.

Silene inflata, *Sm*. Low damp meadows, and road-sides, not uncommon.

S. maritima, *With*. Round the shores.

Lychnis Flos-cuculi, *Linn*.

L. diurna, *Sibth*.

L. vespertina, *Sibth*.

L. Githago, *Linn*.

Sagina procumbens, *Linn*.

S. nodosa, *Meyer*.

Spergula arvensis, *Linn*.

Honckenya peploides, *Ehrh*. Round the shores.

Spergularia marina, *Auct*.

——marginata, *DC*. School Bank, Isle of Walney. Morecambe shores at Greenodd; Tridley marsh, nearer Ulverston.

Arenaria serpyllifolia, *Linn*.

——leptoclados, *Guss*. Top of Humphrey head.

A. verna, *Linn*. With double flowers on Hampsfield Fell, Cartmel, 400. M. Lime.

A. trinervis, *Linn*.

Stellaria media, *With*.

S. Holostea, *Linn*.

S. graminea, *Linn*.

S. uliginosa, *Murr*.

Cerastium glomeratum, *Thuill*.

C. triviale, *Link*, 1200. Gr. S. and Par.

C. tetrandrum, *Curt*. North End rabbit-warren, Isle of Walney; and wall-tops near Ulverston.

Linum usitatissimum, *Linn*. Road sides, but not frequent.

L. catharticum, *Linn*.

Malva moschata, *Linn*. Found in many localities, but not common.

M. sylvestris, *Linn*. Less frequently observed.

Tilia intermedia, *DC*. Often clipped down in woods and hedges, though occasionally growing to a fine tree.

Hypericum Androsæmum, *Linn*.

H. perforatum, *Linn*.

H. quadrangulum, *Linn*.

——dubium, *Leers*. Isle of Walney; and lanes near Penny Bridge.

——tetrapterum, *Fries*.

H. humifusum, *Linn*. Not unfrequent.

H. pulchrum, *Linn*.

H. Elodes, *Linn*. Boggy marshes, Isle of Walney.

Acer Pseudo-platanus, *Linn*.

Erodium cicutarium, *L'Her*. Type common round the shores.

—var. "With unusually small flowers, and finely-cut leaves." Mr. J. G. Baker. Drylands, Isle of Walney.

Geranium phæum, *Linn*. Under trees in Little Croft park. Ulverston.

G. sylvaticum, *Linn*. By Seathwaite Tarn beck, at Newfield.

G. pratense, *Linn*. Near Urswick Church; Plumpton Hall gate, on the salt-marsh.

G. molle, *Linn*.

G. dissectum, *Linn*.

G. columbinum, *Linn*. Plumpton woods.

G. lucidum, *Linn*.

G. Robertianum, *Linn*.

G. sanguineum, *Linn*.

——lancastriense, *With*. I was told that this had become extremely rare, if not quite eradicated, at Lawson's old station; but I was glad to find it, last summer, extending from Tummerhill, (its northern limit) to the south end of the Biggar Bank—a full mile; both in the beach gravels, and on the grassy sward.

Impatiens Noli-me-tangere, *Linn.*

Oxalis Acetosella, *Linn.*

Euonymus europæus, *Linn.* Frequent in woods.

Rhamnus Frangula, *Linn.* Frequent in woods, and edges of peat-moss.

Sarothammus scoparius, *Kooh.*

Ulex europæus, *Linn.*

U. nanus, *Auct.*

——Gallii, *Planch.* Frequent.

Genista tinctoria, *Linn.* Abundant on crags and rocky pastures.

Ononis arvensis, *Linn.*

—spinose variety. Round the shores.

Anthyllis Vulneraria, *Linn.*

——Dillenii, *Schult.* Hampsfield Fell. 400. M. Lime.

Medicago lupulina, *Linn.*

Melilotus officinalis, *Willd.*

M. vulgaris, *Willd.* A starved solitary specimen near a farm.

Trifolium repens, *Linn.* 1500. Walna Scar.

T. pratense, *Linn.*

T. medium, *Linn.*

T. hybridum, *Linn.*

T. procumbens, *Linn.*

T. minus, *Relhan.*

Lotus corniculatus, *Linn.*

—villose variety. Sandy Gap; Isle of Walney; also on Biggar marsh.

L. major, *Scop.*

Ornithopus perpusillus, *Linn.* Hills near Ulverston. 625. Con. Grits.

Vicia Cracca, *Linn.*

V. sativa, *Linn.*

——segetalis, *Thuill.* Plumpton.

V. sepium, *Linn.*

V. hirsuta, *Koch.*

Lathyrus pratensis, *Linn.*

Orobus tuberosus, *Linn.*

Prunus communis, *Huds.*

——spinosa, *Linn.*

——insititia, *Linn.* Rosshead hedges, near Ulverston.

——*domestica*, *Linn.* Near Barnbeck farm, Pennington.

P. Padus, *Linn.* Old high hedges at the Crag, near Ulverston; Seathwaite, Furness Fells.

P. Cerasus, *Linn.* Occasionally seen in hedges, but rare.

P. Avium, *Linn.* In most woods.

Spiræa Ulmaria, *Linn.*

S. Filipendula, *Linn.*

S. *salicifolia*, *Linn.*

Geum urbanum, *Linn.*

G. rivale, *Linn.*

Potentilla anserina, *Linn.*

P. reptans, *Linn.*

P. Tormentilla, *Sohenk.*

——procumbens, *Sibth.* Graythwaite woods, Bann. Sl.

P. Fragariastrum, *Ehrh.*

Comarum palustre, *Linn.* Peat-trenches, Plumpton; Urswick Tarn.

Fragaria vesca, *Linn.*

F. elatior, *Ehrh.* By a brook in a narrow high-banked lane in the vale of Newland, near Ulverston, a quarter of a mile from an ancient farmstead called The Falls. [Miss Parker.]

Rubus saxatilis, *Linn.* Rowdsey wood.

R. Idæus, *Linn.* Not unfrequent.

R. fruticosus, *Linn.*

——suberectus, *Anders.*

—affinis, *W. et N.* The Flan, Ulverston; Foxfield on the Duddon.

——rhamnifolius, *W. et N.* Mungeon; Back Redding's allotment, Cartmel.

—cordifolius, *Angl.* Beyond the Flan; Tilberthwaite

Ghyll bridge. 500. Gr. Sl. and Por.

—Lindleianus, *Lees*. Below Bowstead gates, near Ulverston.

——corylifolius, *Sm.* North Scale Lanes, Isle of Walney; top of Humphrey head.

——discolor, *W. et N.* Furness Abbey; top of Humphrey head; road sides above Grange.

——umbrosus, *Arrh.* Finsthwaite woods [Mrs. James Hodgson.]

——Radula, *Weihe.* Brick kiln lane, Ulverston, and plantations near.

——pallidus, *Weihe.* Mansriggs wood, near Ulverston; Bigland Hill, Cartmel; Finsthwaite woods [Mrs. James Hodgson.]

——glandulosus, *Bell.*

—Bellardi, *Weihe.* By the edge of Long House Ghyll, Walna Scar, about a mile from Seathwaite Church. 600. Gr. Sl. and Por.

Rosa spinosissima, *Linn.* On all the shores; inland lanes both of Furness and Cartmel; Brathay woods; near Birks bridge, on the Duddon. 500. Gr. Sl. and Por. Con. Lime. Bann. Sl. M. Lime. Perm.

R. mollissima, *Fries.*

——mollis, *Sm.* Below Mungeon, Cartmel. 400. Bann. Sl. near Newfield, Seathwaite. 360. Gr. Sl. and Por.

R. tomentosa, *Sm.* South side of Little Langdale tarn. 330. Gr. Sl. and Por. woods between Stott Park and Graythwaite. 175. Abundant on Legbarrow Crags, near Penny bridge. 200. Tottlebank lanes, Colton. 200. Bann. Sl.

R. canina, *Linn.* Typical form frequent.

——sphærica, *Dumort.* Rosshead hedges, Ulverston. 250. M. Lime. Near Haverthwaite. 50. Bann. Sl. Road between Cark and Cartmel. 80. Bann. Sl. Foxfield Bank. 50. Con. Grits.

——dumalis, *Bechst.* Rosshead hedges. 250. M. Lime. Greenodd rocks by the shore. Bann. Sl.

——urbica, *Leman.* Lanes about Ulverston; woods near Broughton.

——frondosa, *Steven.* Near the railway bridge, Haverthwaite. 60. Bann. Sl. Foxfield Bank. 50. Con. Grits.

——Reuteri, *Godet.* On the road to Low Skathwaite, north of Ulverston; road sides above Grange.

——subcristata, *Baker.* Rosshead hedges; roadside below Mungeon, Cartmel; roadside between Flookburgh and Humphrey head.

R. arvensis, *Huds.* By the old well at Bouth, Rusland. 100. Bann, Sl. Birkdault, Haverthwaite. 50. Bann. Sl.

Agrimonia Eupatoria, *Linn.*

Sanguisorba officinalis, *Linn.* Swampy meadow south of Little Langdale tarn. On the banks of the Brathay, near Windermere.

Poterium Sanguisorba, *Linn.* Roadsides above Grange; Plumpton quarry by great spring pit.

Alchemilla vulgaris, *Linn.*

A. arvensis, *Scop.*

Mespilus germanica, Linn. Two

trees in a high old hedge between Walney Church and Northscale, east side of island.

Cratægus Oxyacantha, *Linn.*

——monogyna, *Jacq.* The usual form.

Pyrus communis, *Linn.* A fine tree in a hedge facing Morecambe shore at Bardsea near Ulverston.

P. Malus, *Linn.* Not unfrequent.

——acerba, *D.C.* Seawood near Bardsea; in a hedge near Tottlebank Chapel.

——tomentosa. Plumpton woods; Hilltop, near Penny bridge; Barrow End cliff-face, near Greenodd.

P. Aria [Typical *Aria* of Boswell-Syme.] Cliffs Plumpton shore, Ulverston; M. Lime. Several trees of this occur in that old wood, and are gradually scarped down by high tides and winds.

P. Aucuparia, Gærtn. Hilly hedges.

Epilobium angustifolium, *Linn.* By the beck at Newland, perhaps an old garden escape?

E. hirsutum, *Linn.* Ditch sides, Flookburgh; Little Mill Fields, near Dalton.

E. parviflorum, *Schreb.* Edge of mill-pond, Bardsea; about the slate-quarries, Walna Scar; near Skathwaite, Penny bridge.

E. montanum, *Linn.*

E. palustre, *Linn.* Peat mosses, Ulverston; Newland, by the blacking mill.

E. tetragonum, *Linn.*

——obscurum, *Schreb.* Mansriggs wood, near Ulverston.

Circæa lutetiana, *Linn.* Banks of River Crake; between Lake Side and Graythwaite.

Hippuris vulgaris, *Linn.* Bardsea mill-pond.

Myriophyllum spicatum, *Linn.* Urswick tarn.

M. alternifolium, *DC.* Cark beck, Cartmel; Urswick tarn.

Callitriche verna, *Linn.* Clerk's-beck tributary. Urswick tarn.

C. platycarpa, *Kutz.* In a spring at The Crag, near Ulverston; Plumpton lanes ditches.

C. hamulata, *Kutz.* Cartmel beck; Lightburn, Ulverston.

Lythrum Salicaria, *Linn.* By river Crake; by Urswick tarn; damp meadows near south shores, not unfrequent.

Montia fontana, *Linn.*

——rivularis, *Gmel.* Gill beck, Ulverston; ditch at North End, Isle of Walney.

Scleranthus annuus, *Linn.* Rocky fields and wall tops.

Ribes nigrum, *Linn.* Between Bowstead gates and the Blacking mill; Angerton moss.

R. rubrum, *Linn.* Newby Haw, Haverthwaite; Hearings wood, Ulverston; Bank House Ghyll Kirkby.

R. Grossularia, *Linn.* Frequent in woods and roadside hedges.

Sedum Telephium, *Linn.* Old walls about Furness Abbey; in an old hedge, Ulverston; Low Water Head, Coniston.

(*To be continued.*)

ON A NEW SPECIES OF *HELENIOPSIS* FROM FORMOSA.

BY J. G. BAKER.

THE genus *Heleniopsis* is one of great systematic interest, combining as it does the extrorse anthers of *Colchicaceæ*, with a loculicidal capsule terminated by a perfectly entire style with a capitate stigma, as in *Liliaceæ*, and a densely-packed mass of little seeds tailed at one or both ends, as in *Juncus* and *Narthecium*. *Sugerokia* of Miquel is evidently, as has already been pointed out by Maximowicz, not worthy of generic separation. Three species are known in Japan, and I have now a fourth to add, which has been discovered by Mr. Swinhoe in Formosa, which differs from the others in the inflorescence being umbellate instead of racemose.

H. UMBELLATA, *Baker*, *n.sp.* Rhizomate brevi præmorso fibras copiosas ferente, foliis radicalibus 6-10 rosulatis oblanceolatis spathulatis 1-1½ poll. longis 7-nervatis apice obtusis distincte mucronatis in petiolum brevem angustatis, scapo 3-4-pollicari bracteis 3-4 amplectentibus lanceolatis submembranaceis adpressis, floribus 3-9 umbellatis, pedicellis flore vix superantibus, perianthio 3-4 lin. longo, segmentis oblanceolato-spathulatis albido-viridulis obtusis ½ lin. latis, staminibus breviter exsertis, stylo 3-4 lin. longo superne crassiori distincte exserto, stigmate capitato peltato. *Formosa*, Swinhoe!.

The specimens are in flower only, so I cannot say anything about capsule and seeds.

SHORT NOTES.

ANTHOXANTHUM PUELII, *Lec. & Lam.* IN ENGLAND.—Will botanists look out for this little grass in their districts? Mr. F. Townsend collected a plant near Netley in Hampshire this summer, which he is in all probability right in referring to the species, though the single fragmentary specimen he secured would be scarcely sufficient for any botanist less familiar with the continental flora than he is to determine. This specimen is now in the British Museum, which contains also a series of no doubt the same species from the neighbourhood of Knutsford, Cheshire, collected in 1872 by Mr. Britten as a very marked variety of *A. odoratum*. These latter quite agree with foreign examples of *A. Puelii*, which we have here from many parts of France, Spain, Portugal, Hanover, and the Canaries. It is distinguished from *A. odoratum* by being annual, by its smaller size and tufted habit of growth much branched from the base, by its lax rather unilateral inflorescence with smaller spikelets, and by the upper of the barren flowers being provided with an awn, which projects fully a third beyond the upper glume and is thus plainly visible. The plant was first described in 1847 by Lecoq and Lamotte in their 'Cat. raiss. des plantes vasc. du plateau centr. de la France' (p. 385), where is a long description. Good accounts will be found also in Grenier and Godron's 'Flore de

France,' vol. iii., p. 443, Boreau's 'Flore du Centre' (ed. 3), p. 697, and Willkomm and Lange's Spanish Flora, vol. i., p. 38. Boreau gives another species, *A. Lloydii*, Jord., which, from the description appears to be a smaller plant; perhaps a stunted form. There is, of course, a measure of doubt about the native character of the Netley locality, but it is not unlikely that as the plant occurs in Cheshire a search will reveal it in other places also.—HENRY TRIMEN.

FALCARIA RIVINI, *Host.*, IN HANTS.—This plant has occurred abundantly this season in a field of vetches on my farm at Thruxton. The most curious fact is that the vetches are from my own seed, which I have had by me for many years in cultivation. In fact for the last twenty years I have never known foreign seed of any description sowed in that particular field, and yet I feel confident that the plant has never turned up elsewhere on my farm. Where I have unquestionably sowed foreign seeds, such as vetches, clover, &c., I have occasionally found the following plants, and generally in plenty:—*Vicia monantha*, *Gypsophila Vaccaria*, *Silene conica*, *Alyssum calycinum*, *Camelina sativa*, *Phalaris canariensis*, and perhaps a few others, but never *Falcaria.* I fancy the plant has been there some time, as I tried to get up some of the roots with an iron bar, but they had penetrated more than a foot below the surface. The root-leaves wither before the plant flowers. I am indebted to Dr. Trimen for kindly naming the plant for me.—HENRY REEKS.

PLANTS OF CO. CORK.—Early in the present year I discovered a new station for an interesting species, *Juncus acutus*, Linn. It grows freely in one spot on the left bank of the Rowry river, a little above the small harbour of Millcove, near Glandore. It grows here not on the coast, but on the tidal portion of the river.—Near this station in clefts of a projecting crag grows sparingly the rare form of *Asplenium*, *A. acutum*, Bory.—*Carex pendula*, not before noticed in the W. of this county grows in one spot close to the sea at Glandore.—*C. divulsa*, noted in the 'Cybele Hib.' as very rare, is frequent in this county. I have as many as 16 stations noted.—I may add a few remarks as to the two commoner gentians, *G. campestris* and *G. amarella.* Both are very local and restricted in their distribution in this county, the latter especially so; yet in one tract near Ballinadee they flourish in extreme abundance. *G. amarella*, which can hardly be found anywhere else in this very extensive county, grows in the district alluded to in tens of thousands.—T. ALLIN.

TREE-FERN FROM LORD HOWE'S ISLAND.—The fine tree-fern described by Baron von Mueller in the part of his "Fragmenta" just received (vol. viii., p. 176) under the name of *Hemitelia Macarthuri* is identical with the *Cyathea Moorei* of the yet unpublished second edition of Hooker and Baker's Synopsis Filicum, p. 453. As our book is now all printed off, except the index, I have no opportunity of inserting in it this identification. It seems to me that Cyatheoid involucres are the rule in the plant and Hemitelioid the exception, and I should prefer therefore, whilst adopting Dr. Mueller's specific name to keep to the genus in which I had already put it, and to call the plant *Cyathea Macarthuri*. Involucre apart, it is so like *Alsophila excelsa* that at the first rough sorting I took it so be that species, an idea which the first glance with a lens at the sori dispelled.—J. G. Baker.

CALLITRICHE OBTUSANGULA, *Le Gall*, IN KENT.—I enclose a small quantity of a *Callitriche* which Dr. Boswell Syme tells me is *C. obtusangula*. I gathered it last June in the marshes between Deal and Sholden, and it struck me then as being different from any I had ever seen.—J. F. Duthie. [Only previously recorded from Isle of Wight and Cambridge.—See Journ. Bot. 1870, p. 342, and 1872, p. 78.]

RUMEX SYLVESTRIS, *Wallr.* IN HERTS.—On Aug. 15th when botanising in company with Mr. R. A. Pryor, I noticed a *Rumex* which looked different from ordinary *R. obtusifolius*. On comparing the specimens collected with those in the British Museum, I find some of them to be intermediate in characters between Mr. Warren's Thames-side Dock, described in the last volume of this Journal (p. 129 and tab. 131) and the usual *R. obtusifolius* (*R. Friesii*, Gren. & Godr.) of England. Others are nearly typical *R. sylvestris*, with the more erect branches and scarcely-toothed perianth-leaves, each of which bears a large tubercle. Both Mr. Warren and Dr. Trimen have seen specimens. The exact locality is a brickfield close to the River Lea between Hertford and Ware.—T. B. Blow. [Mr. Blow's specimens appear to strongly support the view expressed in the paper above quoted (p. 140) that *R. sylvestris* and *R. Friesii* are merely the extremes of one species with various intermediate states.—*Ed. Journ. Bot.*]

ISOETES LACUSTRIS IN SHROPSHIRE.—In the list of Shropshire plants compiled by the late Rev. E. Williams, Minister of Battlefield, *Isoetes lacustris* was put down for the well-known botanical locality Bomere Pool where so many good plants are found, but since his time it has been searched for by other botanists without success. Owing to the dryness of the present summer the pool has been much lower than usual, and on visiting it in July and August I was pleased to find *Isoetes* in tolerable abundance at the south end near the boat-house, in company with *Lobelia Dortmanna*, *Littorella lacustris* and *Elatine hexandra*. It does not attain here so large and robust a growth as in Llyn Ogwen and other Welsh lakes. The usual form in which it occurs is with spreading leaves, curved outwards from the base; but occasionally it takes the upright form with straight leaves. It is not improbable the *I. echinospora* may be detected here also, though as yet I have not been able to find it. I have about a dozen dried specimens which I shall be glad to distribute as far as they will go to the readers of this Journal.—William Phillips.

LICHENS IN INDIA.—I have been last January up to Allahabad, and reckoned upon a good harvest of Cryptogams, especially of

Lichens. I had armed myself with all the necessary implements, but could not detect a trace of a Lichen, either on the trees or on the quartz rock of the Rewah hills (70-80 miles south of Allahabad). Such a complete absence of these plants I have never yet experienced since I have been in India. Nothing but a blackish colouring of a doubtful nature was to be seen here and there. This is the more strange as in 1869 I found in the Korrackpore hills, south of Monghir, quite a quantity of saxicolous Lichens on the pure quartz rocks quite exposed to the sun. On the other hand I obtained two or three mosses, one *Marchantia*, several Fungi, and a good number of *Algæ*, especially in the waters of the Ganges and Jumna, where *Zannichellia* and *Potamogeton* form extensive masses on which a *Synedra* was very abundant.—S. KURZ.

Notices of Books.

Norges Flora eller Beskrivelser af de i Norge vildtvoxende Karplanter tilligemed Angivelser af deres Udbredelse. 2 den Del, 1ste Helfte af AXEL BLYTT. Christiania, 1874.

The Conservator of the University Herbarium at Christiania is to be congratulated on having at length carried on the excellent Flora of Norway, commenced in 1861 by his father, the late Prof. M. N. Blytt. That first part comprised the whole of the Monocotyledons; the continuation now before us, goes on with the Apetalæ and gets well into the Gamopetalæ, which it is hoped to finish in another part, to appear before the end of the year.

The book is a national one, and is written entirely in the Norwegian language. The descriptions appear to be very full, and are founded on the examination of extensive series of specimens. The author is well known to be an energetic practical botanist, and has the advantage of possessing the material collected by his father, and full access to the fine herbarium of the plants of Norway in the University Museum. The quotation of synonymy, figures, and exsiccata is mainly confined to Scandinavian publications. The distribution of each species is traced through three districts, founded on the natural watersheds of the country; the "ostenfjeldske," or south-eastern portion; the "vestenfjeldske," or western district up to lat. 63°; and the "nordenfjeldske," comprising all the country north of the Dovrefjeld. M. Blytt has kindly given the following information with reference to distribution in altitude. There are 5 regions ("belter") distinguished in the Flora:—1. the "Kornbeltet," in which corn is cultivated; the upper limit of this in the "ostenfjeldske" is usually about 2000 Norwegian feet above the sea; 2 "Bartroernes region," the region of Pines (*P. Abies* and *P. sylvestris*) which extends in the same district up to about 2800—3000 ft.; 3 "Birkebeltet," the Birch region (*Betula odorata*, Bechst.) which ascends from the limit of the pines up to 3500 ft.; 4 "Vidiebeltet," the region of willows (*Salix glauca*, *S. Lapponum*, *S. lanata*) which with *Betula nana* ascend to about 4400—4500 ft.; and 5 "Laobeltet," the Lichen region in which *Salix herbacea*, *Vaccinia*, &c., and herbaceous plants are found, and which extends up to the snow line; the limit of phanerogamous vegetation in Ostenfjelds is at about 5200 ft. All these limits sink towards the west and north. Under each species is found an indication of the bounds of its range both northward and southward.

The Norwegian Willows have been elaborately monographed for the Flora by Prof. N. J. Andersson, of Stockholm, so well-known for his researches in this difficult genus, and occupy over 60 pages of the volume. This Flora is worth the attention of English botanists.

H. T.

Prodromus Floræ Hispanicæ: auctoribus MAURITIO WILLKOMM et JOANNI LANGE. Vol. III., pars I. Stuttgart, 1874.

It is a very agreeable surprise to be able to peruse a new part of this valuable Flora of Spain, which one had some reason to fear was, from causes chiefly monetary, forced to come to a standstill. Its eminent authors merit the thanks of the botanists of Europe for their perseverance in carrying on their labours in spite of such discouragement. It is four years since we had to chronicle the appearance of the last part, which concluded the gamopetalous orders. In this new part the polypetalous families are commenced by the *Umbelliferæ*, followed by the *Saxifragaceæ*, *Crassulaceæ*, *Paronychiaceæ*, *Onagrarieæ*, and the smaller allied orders, and the greater part of the *Rosaceæ*. Prof. Lange has worked up the Umbellifers and the *Onagrarieæ;* the remaining orders are by Prof. Willkomm, with the exception of the *Lythrarieæ*, the few species of which have been elaborately treated by Knerskon, and the Roses which Crépin has described. The *Umbelliferæ* are very strongly represented in Spain, no less than 221 species being included in the Flora; in their arrangement Prof. Lange has largely followed Bentham and Hooker's "Genera Plantarum," though he gives reasons for differing in some points from that work. Only a single new species is described, and there has been but little transposition of species into other genera; indeed, this order appears to have undergone a very thorough and careful investigation. *Physospermum cornubiense* is placed as a variety under *P. aquilegiæfolium*, from which it differs only in its smaller size. In the Saxifrages, Prof. Willkomm has not adopted Engler's recent classification of the genus. The section *Chætonychia* of *Paronychia* is raised to a genus for the singular little plant *C. cymosa*. The fruticose *Rubi* are thirteen in number; all, save one, widely-distributed forms.

It may now be confidently hoped that the Professors will in due time complete their Flora in the same excellent style which has characterised it hitherto, with full descriptions and detailed distribution of all the species. We shall then only want as good an account of the plants of Portugal to possess a full knowledge of the Flora of the great south-western peninsula.

H. T.

A Manual of Botany, Anatomical and Physiological, for the use of Students. By ROBERT BROWN, M.A., &c., Lecturer on Botany. Edinburgh: Blackwood and Sons. 1874. (Pp. 614.)

Most persons qualified to judge will agree with the author of this new text-book that an explanation, apology, or defence such as we have in his preface, was to be expected. To give merely a list of the Manuals of Botany which have appeared in this country during the last twenty or thirty years would occupy several pages, and a new comer into the already too crowded field is likely to be rather critically looked at, and the reasons for its appearance carefully examined. It is true that in spite of the number of elementary works there is no one of pre-eminent merit, and that a first-rate text-book in English has for some time been a want strongly and extensively felt. Such a book—clear, comprehensive, accurate—giving us the results of real work in botany, and bearing the stamp of the mind of a master in the science, who can separate what is of value from what is worthless, and present to his readers an original, harmonious, and consistent treatise, we all want. Another compilation, however laborious, of the old familiar sort, we do not. Dr. Brown thinks the great advance of physiological botany on the Continent during the last few years a sufficient apology for printing a new text-book in England on the whole science of botany: it might be perhaps a question whether he would not have done us better service if he had been content to translate and abstract the more important French, German, and Scandinavian researches for the use of English students. The indiscriminate collections of a lecturer's notes, however useful for their intended purpose, are scarcely suitable for publication as a sustained treatise, certainly not without far more care than, it must be confessed, appears to have been bestowed on the book before us.

No doubt the author has done his best to include all the facts he thought of importance in "upwards of twelve hundred separate papers and treatises" in various languages, which he claims to have consulted, and certainly he spread his net wide enough; no doubt also there is a very large amount of information of unequal value as a result; but as a digest it is impossible to speak of the new manual as a success. It is scarcely to be wondered at if the author were overwhelmed by the mountain he had gathered; to attempt *de novo* to make an abstract of everything one can lay one's hands upon in structural and functional botany and boil it down into a new text book is a task from which most persons would recoil.

It is not intended to criticise the book in full detail; but the contradictions and obscurities which not unfrequently occur (doubtless as a result of indiscriminate compilation) are especially unfortunate in a treatise intended for the use of students. Those who are familiar with them, and know the blind faith they place in what they read, can only pity the student who finds prosenchyma defined as two different things on pp. 13 and 38, the endophlæum made synonymous with the cambium layer at p. 82 and with the bastlayer at p. 89, and a statement that stipules are absent in all dicotyledons with opposite leaves on the same page (150) with a description of interpetiolar stipulation. Nothing is more disheartening to a beginner than such loose writing, unless it be the modification or explaining away of statements at first made absolutely, which fault also occurs in the volume.

Some of the definitions are very misleading, as that of dimorphic plants, "when two of the stamens are long and two short" (p. 462), where the author must have been thinking of didynamous. The pods of *Cassia* are called follicles (p. 485) and the seeds of Juniper said to be surrounded by an arillus (p. 515). We are told (p. 74) that each internode of a dicotyledonous stem represents a year's growth, and (p. 268) that leguminous plants derive their nitrogen from the air, though ten pages back the source of this element had been rightly stated. The Mistletoe and Broomrape are given (p. 124) as examples of "the parasitic plants known as *epiphytes*" a singular confusion of terms; further on the aërial roots of Mistletoe are mentioned (p. 142). Very unfortunate is the attempt to give an idea of the range of size in leaves (p. 146) by mentioning as extremes the fronds of *Macrocystis* and *Lemna*; this reminds one of the popular summary of fishes "from the whale to the shrimp." Such errors as these, though evidence only of carelessness, become serious in a student's book. So too the very numerous misprints are much to be deprecated, and could have been readily avoided; 'tubular' occurs several times for tabular in the descriptions of the tissues, and the errors in the names of plants and of persons are far too frequent to allude to particularly. Some of the plant-names are very strange. Probably most students will be able to correct the teacher who calls *Syringa persica* the Mock Orange, and *Thlaspi alpestre* the Penny-royal, but *Lycopodium Chamæcyparinus* is likely to prove a puzzle. One scarcely expected to find the old herbalists' name for *Acorus Calamus* revived; but in any case *Calamus* as a genus is long pre-occupied by the Palms.

It is impossible to praise a treatise with such evidences of want of care on the surface, yet there are some points in which the new manual is in advance of others; the account of fertilization seems more complete than any elsewhere, and embodies the various contributions which during the last few years have been made by a very numerous band of observers. The figures are also very good, many being from Duchartre's "Eléments," and Germain de St. Pierre's "Nouveau Dictionnaire," and some original. It is a relief to miss the well-worn woodcuts which have done duty in so many text-books.

Only the anatomy and physiology of phanerogams find a place in the volume. A second is promised, to include historical, systematic, economic, fossil, and geographical botany, and an account of the cryptogams. To say the truth such a volume is wanted neither by botanists nor students. With the exception of the history of botany, we have now good special books on all the branches enumerated, and Balfour's "Class-book" surely suffices for students at Edinburgh or elsewhere. A new text-book on Cryptogamic Botany is a desideratum; and a history of the science from anyone who had made it a life-study would be of surpassing interest; but *nec scire fas est omnia*, and we cannot expect Dr. Brown to do more than re-arrange the matter in existing manuals. With all his perseverance his first volume can scarcely be held to prove him a compiler of the first rank. H. T.

Wandtafeln für den Naturwissenschaftlichen Unterricht, mit specieller Berücksichtigung der Landwirthschaft. III. serie. *Pflanzenkunde* von L. KNY. Berlin, 1874.

This is the first part, consisting of 10 sheets with accompanying text of 22 pages in octavo, of an educational series of botanical diagrams. Each diagram is 33 in. long by 27 in. wide, well printed in colours. The subjects represented are the structure of living cells, starch granules, raphides and plant-crystals, the conjugation of *Spirogyra*, the laticiferous canals, unicellullar hairs and glands, the fibro-vascular bundles of mono- and dicotyledons and the development of the embryo in *Brassica Napus*. They go into more detail than is customary in such aids to class-instruction, and, indeed if one felt inclined to criticise these excellent diagrams, one might say they are too good. They well repay close examination, and much of the information they contain would be necessarily lost on the walls of a lecture theatre.

H. T.

The London Catalogue of British Plants. Seventh Edition. London: R. Hardwicke, 1874. (Pp. 32.)

This list, the first edition of which appeared in 1844, is of the greatest utility to British botanists. Not a few local Floras have been arranged in accordance with it, and the general correspondence in nomenclature of the sixth edition with Dr. Syme's English Botany did much to familiarise botanists with the changes of name introduced in the latter work. Of this sixth edition a full notice will be found in our vol. for 1867, p. 217; and it is only necessary to indicate on the present occasion the points in which the seventh differs from it. The principal of these consists, as Mr. Watson tells us in his "explanations," "in a re-numbering of the specific names, and in those changes of technical arrangement which have now rendered it necessary to abandon the original series of numbers." We pointed out the desirability of some such course in the review referred to; and its adoption renders the present edition the most useful for practical purposes that has yet appeared. The list now includes 1680 species and subspecies, "as understood by Dr. Hooker in *Students' Flora*, and Dr. Boswell-Syme in *English Botany*," 125 of which are italicised. The *Students' Flora* has been followed in some cases in preference to English Botany, as in the restoration of the genera *Tanacetum* and *Matricaria*. *Glaucium violaceum* is altogether omitted, no doubt through inadvertence. The census-numbers have been revised in accordance with *Topographical Botany*, the second and concluding part of which has recently been privately distributed. As the number of copies of this latter work is very limited, it may be useful to mention that the author has presented it to the Herbarium Library at Kew and to that of the Department of Botany of the British Museum.

J. B.

Botanical News.

Articles in Journals.

Ann. des Sc. Naturelles (ser. 5, tom. xix., n. 6, June).—P. P Dehérain and H. Moissan, "Researches on Absorption of Oxygen and Emission of Carbon Dioxide in plants kept in darkness."—P. P. Dehérain and E. Landrin, "Researches on Germination."—Pfeffer, "On the Influence of Light in the regeneration of Albuminoid matters at the expense of the Asparagine formed during Germination."

July.

Scottish Naturalist. — J. Keith, "Fungi of Morayshire" (contd.).

Monthly Microsc. Journal.—R. Braithwaite, "*Sphagnum squarrosum*, Pers. (tab. 67) *S. teres*, Angstrom" (tab. 68).

Oesterr. Bot. Zeitschr.—F. Sauter, "Moss Flora of N. Tyrol."—J. Kerner, "*Salix digenea* (*viminalis* × *daphnoides*)."—J. A. Tauscher, "On Flora of Hungary."—A. Oborny, "On Flora of S. Moravia" (contd.).—A. Kerner, "Distribution of Hungarian Plants" (contd.).—J. C. Schlosser, "The Kalnicker Gebirge."

Hedwigia.—Thümen, "A new species of *Protomyces*."—A. Geheeb, "Bryological Notes."

Bot. Zeitung.—H. Conwentz, "On the action of Camphor and similar powerful agents on the life of Plant-cells" (contd.).—A. Batalin, "On the destruction of Chlorophyll in living organs."—D. Wetterhan, "On *Podospermum calcitrapifolium*, DC."—E. Warming, "Observations on the Ovule."—F. Hegelmaier, "On certain *Lycopodiaceæ*."

Flora.—H. Wydler, "Remarks on the Pentamerous Flowers of *Ruta*" (tab. 4).—H. Wawra, "On Flora of Hawai Islands" (*Gouldia axillaris*, n.s., *Coprosma Waimeæ*, n.s.).—M. Micheli, "Preliminary Notes of new *Onagrarieæ* from MS. for Flora Brasiliensis" (13 new species of *Jussieua; Oocarpon, gen. nov.* = *J. oocarpa*, Wr.)*—W. Nylander, "Add. nova ad Lichenographiam Europæam, xviii" (47 new species; 12 from Britain).—A. Geheeb, "On *Amblystegium formianum*, Fior.-Mazz."—J. Müller, "Lichenological Contributions" (2 new species).

Journ. Linn. Soc. Lond. (n. 76, July 31st).—H. A. Weddell, "A new African Genus of *Podostemaceæ*" (*Angolæa*; tab. xiii.).—J. G. Baker, "Revision of Genera and Species of Tulipeæ."

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* There is also a paper by M. Micheli, "On the Onagrarieæ of Brazil, and especially on the genus *Jussieua*" in the Arch. des Sc. de la Bibl. Univ. de Genève for June.

An enumeration of the Oriental *Labiatæ* with description of the new species, and a long geographico-botanical introduction by Bunge has been published in the Mémoires de l'Acad. imp. des Sc. de St. Pétersbourg (sér. 8, tom. xxi., n. 1).

We understand that a Flora of Mauritius and the Seychelle Islands is likely soon to be put in hand as one of the colonial series issued from Kew. Mr. Baker will undertake the editorship.

We read in the *Gardener's Chronicle* that Mr. W. B. Hemsley is about to undertake a series of botanical monographs with the special object of determining and naming plants cultivated in gardens. He will commence with the *Musaceæ*, *Marantaceæ* and *Zingiberaceæ*.

The recently printed "Report on the condition of the Sea Fisheries on the S. Coast of New England in 1871 and 1872," contains a catalogue of the Algæ of the coast by Dr. W. G. Farlow.

Dr. Gerard Rohlf's expedition into the unknown part of the Western Egyptian or Lybian desert has been very successfully carried through. The traveller was accompanied by Profs. Jordan and Zittel, and Dr. Ascherson, of Berlin, as botanist. They left Siout on 17th December last, and reached the oasis of Farafrah on 29th, which had not been visited by an European since Caillioud in 1819. Leaving the oasis on 3rd January this year they passed through a terribly barren district to the large and rich oasis of Dakhel. From here the expedition pushed out into the pathless and utterly unknown region to the west, but after six days it was seen that progress in this direction was impossible. A move to the north-westward was then made, and on the 20th February the caravan reached the oasis of Jupiter Ammon, having been thirty-six days from Dakhel without finding a single well—the iron tanks of Rohlfs containing sufficient water to last all that period. The return journey was made by the Oasis Parva and back to the Farafrah and Dakhel oases. The whole expedition occupied four months and the extent of desert travelled was 1700 miles. Some account of the vegetation of this extensive tract will be found in a letter from Dr. Ascherson, printed in the "Oesterr. Bot. Zeitschrift" for August.

We hear that Mr. I. B. Balfour, son of the Professor of Botany at Edinburgh University, will accompany the Government expedition for observing the transit of Venus to the island of Rodriguez in the Indian Ocean, as botanist. A geologist and a zoologist will also be sent out.

In our number for June we mentioned the almost certain loss of the Rev. Richard Thomas Lowe by the foundering of the steam-ship Liberia, in the Bay of Biscay. The catastrophe happened in April last, and all the persons on board, fifty-eight in number, are supposed to have perished. He was born on December 4, 1802, and in 1825 graduated B.A. at Christ's College, Cambridge, as Senior Optime, being ordained the same year. Obtaining a travelling bachelorship and his health being delicate, he in 1828 visited Madeira, and at once commenced to examine the flora of the island, publishing in 1830 his accurate "Primitiæ Faunæ and Floræ Maderæ et Portus Sancti" in the Cambridge Philosophical Transactions. Two years after, he prepared a valuable series of critical observations on Höll's Madeiran list, and these were printed in the first volume of Hooker's Journal of Botany, 1834. He became English Chaplain in the island in 1832, and remained there till 1854, in all twenty-six years, occasionally visiting the neighbouring isles of the Canaries, and in 1859 the African coast at Mogador. During this period he published numerous papers, chiefly on fishes and shells, in the Zoological Society's Proceedings; and on botany in Hooker's Journal and elsewhere. The "Novitiæ Floræ Maderensis" appeared in the Cambridge Phil. Trans. in 1838. Mr. Lowe's health being re-established, he on his return to England, accepted the living of Lea in Lincolnshire, and soon set about the preparation of a complete Flora, the first part of which was published in 1857, under the title of "A Manual Flora of Madeira and the adjacent islands of Porto Santo and the Dezertas." A second part of this book was issued in 1862, a third in 1864, and two more completing the first volume in 1868; one part only of the second volume has been published so lately as 1872, the lamented author being engaged on the remainder of the Gamopetalous orders at the time of his unexpected death. He had, during the progress of the Flora, returned several times to Madeira with the double object of visiting the English Church there and further investigating botanical questions; and his book is a remarkably accurate and minutely pains-taking account of the vegetation of the group. It is greatly to be regretted that it is left thus unfinished, as there is probably no botanist with the knowledge of the Madeiran flora which was possessed by Mr. Lowe.

Dr. Georg August Pritzel, Librarian of the Academy at Berlin, died at Hornheim, near Kiel, on 14th June, after a long illness. He was born at Carolath, Silesia, on 2nd September, 1815. His indispensable "Thesaurus Literaturæ Botanicæ," 1847-1851, and "Iconum Botanicarum Index Locupletissimus," 1855, with Supplement, 1865, have rendered his name very familiar to all working botanists. The new edition of the former work remains still incomplete, having been interrupted by the illness of its author three years ago, after the issue of the fourth part. Dr. Pritzel is said to have made an extensive collection of German popular plant-names.

In accordance with the resolution passed at the special meeting of the Linnean Society held March 5th (see p. 128), the Council have submitted the questions which were lately so keenly discussed to a "legal authority" for his opinion. Lord Hatherley kindly consented to adjudicate in the matter, and a copy of his opinion as well of the case submitted to him will, we understand, be shortly in the hands of all the Fellows, having been already communicated to the President and Council of the Society. Contrary to our expectation, Lord Hatherley holds that the repeal of the former Bye-laws relating to the Librarian and the new enactment are valid, not contrary to the Charter and therefore binding on the Society. Sorry as we are at this result, and injurious as we still think the now legalised alterations, we have no doubt that a termination of the difficulty will be welcomed by all.

Original Articles.

ON THE ALLIUMS OF INDIA, CHINA, AND JAPAN.

By J. G. Baker, F.L.S.

Having lately attempted to classify the Alliums of the south-eastern half of Asia, about which our handbooks are greatly in arrear of our herbaria, and to compare them with the species of the Orient and Siberia, I propose now to report the result, giving descriptions only of those species which have not been intelligibly described already, and references for the others.

As regards the general classification of this large and intricate genus, it seems to me best to define seven groups, founded upon characters furnished by the bulbs, filaments, spathes, and direction of perianth-segments in the expanded flower, as follows.—

Series A. Holobulbi. Bulbs separate, short ovoid, or globose.

Group 1. Molium. Stamens all simple, spathe-valves short, not tailed, perianth rotate when expanded.

Group 2. Caloscordum. Stamens all simple, spathe-valves short, not tailed, perianth campanulate at its fullest expansion, with filaments inserted higher up than in the last.

Group 3. Codonoprasum. Stamens all simple, spathe-valves with a long distinct tail, usually much exceeding the umbel, perianth segments as in the last.

Group 4. Porrum. Filaments of the three inner stamens with two long side cusps, overtopping the intermediate antheriferous one, spathe-valves short, not tailed; expanded perianth campanulate, as in the two last.

Series B. Synbulbi. Bulbs cæspitose, long, ovoid-cylindrical, often placed on a distinct rhizome, spathe-valves not lengthened out into long tails.

Group 5. Anguinum. Filaments simple, perianth-segments spreading when fully expanded.

Group 6. Rhiziridium. Filaments simple, perianth permanently campanulate, with the filaments springing from a distinct space above the base.

Group 7. Microdon. Filament of inner stamen obscurely three-toothed, perianth permanently campanulate.

Of these groups the only two ^ represented in East Asia are *Codonoprasum* and *Porrum*, which are almost restricted to Europe, North Africa and the Orient, and scarcely extend beyond the Caucasus into Siberia. not /

Group 1. Molium.

√1. A. robustum, *Kar. et Kir.*, Kunth Enum., iv., 446, 689; Afghanistan, *Griffith*, 5813! 5818!; Kashmir, *Falconer*, 1101!; Kistroar, 8-10,000 ft., *Dr. Thomson !;* Hook. fil. and Thoms., no. 18 !. Also inhabits Songaria. Perhaps not distinct specifically from *A. decipiens*, Fisch. (*A. tulipæfolium*, Led.)

Group 2. CALOSCORDUM.

(Characterised as a genus by Herbert, Bot. Reg., xxxiii., tab. 5.)

* Heads not bulbilliferous; leaves broad.

2. A. CASPIUM, *M.B.*, Kunth Enum., iv., 445. Afghanistan, *Griffith*, 5819 !; Beloochistan, *Stocks*, 936 !. A plant of Siberia and Turkistan.

3. A. LORATUM, *Baker, n.sp.*—Bulbus parvus ovoideus, tunicis exterioribus membranaceis pallide griseis. Folia 2-5 lorata basalia acuta 6-9 poll. longa medio 6-12 lin. lata supra basin angustata tenera flaccida plana margine minute ciliata. Scapus gracilis teres 3-6-pollicaris. Spathæ valvæ 2 ovatæ acutæ naviculares umbella breviores. Umbellæ 30-50-flora, haud bulbillifera pedicellis 3-6 lin. longis gracilibus apice incrassatis. Perianthium albidum 1½-2 lin. longum diutine campanulatum segmentis lanceolatis acutis, obscure brunneo-carinatis. Stamina perianthio æquilonga, filamentis exterioribus subulatis, interioribus, basi linearibus. Stylus ovario triquetro-globoso æquilongus. West Tibet, Alpine region, 10-14,000 ft., *Dr. Thomson !.* Of the Oriental species this comes nearest *Akaka* (*latifolium*, Jaub. and Spach), and *colchicifolium*, Boiss.

** Heads not bulbilliferous, leaves narrow.

4. A. NERINIFOLIUM, *Baker.*—Caloscordum nerinifolium, *Herbert, Bot. Reg.* xxxiii., t. 5. Bulbus parvus oblongus tunicis exterioribus albidis membranaceis. Folia 3 basalia anguste linearia subglauca glabra canaliculata 6-9 poll. longa 1 lin. lata. Scapus pedalis gracilis teres. Umbella laxe 15-20-flora haud bulbillifera. Spathæ valvæ parvæ ovatæ. Pedicelli inæquales 1½-3 lin. longi. Perianthium infundibulare 3-4 lin. longum, segmentis oblongis subacutis saturate rubro-purpureis apice falcatis. Stamina perianthio triplo breviora, filamentis linearibus. Stylus ½ lin. longus apice tricuspidatus. Ovarium globosum ovulis in loculo 3. Chusan, *teste Herbert;* Toki, Pekin, *Dr. Cantor*, *in Herb. Bentham !.* A very distinct and handsome species, said to be without any alliaceous scent.

✓ 5. A. RUBELLUM, *M.B.*, *Kunth Enum.*, iv., 399.—A. Jacquemonti, *Kunth Enum.*, iv., 399.—A. leptophyllum, *Wall. Cat.*, 5073, A. Beloochistan, *Stocks*, 1004 !; Afghanistan, ; *Griffith*, 5812, 5820 !; West Himalayas, temperate and sub-tropical region, 2-8000 ft.; *W. S. Webb, in Wall. Herb*, 5073, A ! *Jacquemont*, 138, *Dr. Thomson !*, *Falconer*, 1103 !, *Edgeworth*, 116 !, *Aitchison*, 1211 !. A widely spread Siberian species.

✓ 6. A. GRIFFITHIANUM, *Boiss. Diagn.*, ii., iv., 117. Afghanistan, *Griffith*, 5815 ! 5821 ! 5825 to 5828 !; Beloochistan, *Stocks*, 1061 !; Lahul, *Jæschke*, 94 !. Punjab, Salt range, &c., *Aitchison*, 549 !; *Vicray ! ; Fleming*, 88 !. Kashmir, 5-7000 ft., *Dr. Thomson !* (Hk. fil. and Thom. *Allium*, no. 26), *Edgeworth !.* Also a plant of Kurdistan, and apparently con-specific with the Persian *A. vulcanicum*, Boiss. Diag.

xiii., 33, and Siberian *A. stenophyllum*, Schrenk. Led. Fl. Ross. iv., 172.

** Leaves narrow, heads usually bulbilliferous.

7. A. UMBILICATUM, *Boiss. Diagn.*, ser. ii., pt. iv., p. 113. Afghanistan, *Griffith*, 5814!. Fields in Upper Beloochistan, *Stocks*, 1006! Resembles closely, as already remarked by Bissier, the bulbilliferous forms of *A. roseum*.

8. A. CHINENSE, *G. Don Mon*, 83; *Kunth Enum.*, iv., 454.—A. Thunbergii, *G. Don Mon*, 84; *Miquel, Ann. Mus. Lug. Bat.*, iii., p. 154; A. angustum, *Hook. and Arn., Bot. Beech.*, 272, *non G. Don*; A. nereidum, *Hance, Ann. Sc. Nat.*, sér. 5, vol. v., p. 244. Universally spread, at any rate as a cultivated species, through Japan and China. The following are the numbered specimens I have examined. Japan, *Oldham*, 476!, *Wilford*, 1026; Korean Archipelago, *Oldham*, 875!; Loo-Choo, *C. Wright*, 333!; Shanghai, *Maingay*, 410!; Formosa, *Oldham*, 564! (form without head-bulblets). Isle of Samyet, *Swinhoe!* (Hance, 6509). Both Don's descriptions are too brief to be of much use, but good ones will be found by Hance and Miquel, as cited above, and in Maximowicz, Prim. Amur., 284. The general character of the plant is just that of *pulchellum*, from which the non-bulbilliferous form differs mainly by its exserted stamens.

Group 3. ANGUINUM.

* Leaves broad.

9. A. VICTORIALIS, *Linn.*—A. ellipticum, *Wall. Cat.*, 5069; *Kunth Enum.*, iv., 456. Japan, *C. Wright!*. Temperate and alpine region, spread through the Himalayas, Kashmir, 8-10,000 ft., *Thomson!*, *Falconer*, 1098!, Kumaon, 7500-13,000 ft., *Strachey and Winterbottom!*, Nepaul, *Wallich!*, Sikkim, 10-13,000 ft., *Dr. Hooker!* There is no ground for separating the Indian *ellipticum* from the European *victorialis*, which is one of the most distinct of all the Alliums, and the most widely-spread species, with the exception of *Schœnoprasum*, as it extends all the way from Portugal to Japan.

** Leaves narrow.

10. A. WALLICHII, *Kunth Enum.*, iv., 443—A. cœruleum, *Wall. Cat.*, no. 5076, *non Pallas*—A. violaceum, *Wall. MSS.* Temperate region throughout the Himalayas. West Himalayas, *Falconer*, 1086!, *Royle!*, *Edgeworth!*; Kumaon, 8500 ft., *Strachey and Winterbottom!*, *Blinkworth!*; Nepaul, *Wallich!*, Sikkim, 9-12,000 ft., *Dr. Hooker!*, A very distinct plant with rootstock scarcely at all bulbous, long, glabrous, flat narrow lorate persistent leaves, a lax ample flat-topped umbel, and bright purple linear perianth-segments, reflexed when expanded, like those of *tulipæfolium* and *robustum*. An endemic Himalayan species.

11. A. ODORUM, *Linn.; Kunth Enum.*, iv., 432. West Tibet, alpine region, 10-14,000 ft., *Dr. Thomson;* quite agreeing with the Siberian plant well-known in botanic gardens.

12. A. TUBEROSUM, *Roxb., Hort. Beng.*, p. 24; *Fl. Ind.*, ii., 141; *Wall. Cat.*, 5068!; *Kunth Enum.*, iv., 454—A. Roxburghii, *G. Don Mon*, 91; *Kunth Enum.*, iv., 454—A. uliginosum, *G. Don Mon*, 60;

Kunth Enum., iv., 422—A. senescens, *Miquel, Ann. Mus. Lug. Bat.*, iii., 154, *non Linn.* Bulbi obliqui elongati cylindrici, radicibus crassis numerosis tunicis exterioribus in fibras griseas solutis. Folia 3-6 anguste linearia basalia plana glabra 6-12 poll. longa, 1-2 lin. lata erecta. Scapus gracilis 1-1½ pedalis dimidio inferiori teres, superne anceps. Spatha sæpissime univalvis parva lanceolata caduca. Umbella laxa 20-40-flora, nunquam bulbillifera. Pedicelli ascendentes 6-12 lin. longi. Perianthium 2-2½ lin. longum, albidum vel obscure rubellum, segmentis lanceolatis acutis vel obtusis flore expanso reflexis. Stamina profunde perigyna inclusa filamentis conformibus lineari-subulatis. Ovarium obovoideo-globosum, profunde trilobum, apice emarginatum, ovulis in loculo geminis. Stylis albidus vel rubellus 1½-2 lin. longus, apice vix tricuspidato. Spread through Japan, China, and India, at any rate as a cultivated plant. Japan, *Oldham*, 877 ! ; Pekin, *Dr. Cantor ! ;* Shanghai, *Maingay*, 390 ! ; South China, *Hance*, 245 ! ; Siam, *Sir R. Schomburgk*, 326 ! ; Khasia, *Griffith*, 5822 ! 5831 ! 5832 ! *Hook. fil. and Thoms*, no. 6, *T. Lobb ! ;* West Himalayas, *Royle !* There is a good unpublished drawing of Roxburgh's in the Kew collection, which clearly identifies his plant. The specimens in the Wallachian herbarium are from the Madras garden, sent there from the Moravian mission in Tranquebar. There seems to be no ground whatever for separating *uliginosum* and *Roxburghii* as species.

13. A. HOOKERI, *Thwaites, Enum. Zeyl.*, p. 339. Khasia, 4-5000 ft. *Hook. fil. and Thoms*, no. 7 !, Ceylon, 7000 ft., *Thwaites C.P.*, 3659. Leaf and general habit exactly as in the last, but perianth-segments narrower and sharper, and outer bulb tunics membranous.

Group 4. RHIZIRIDIUM.

* Leaves terete.

14. A. SCHŒNOPRASUM, *L.* Japan, *C. Wright ! ;* West Himalayas, *Falconer*, 1102 ! ; Kumaon, *Strachey and Winterbottom !* Spread from Britain through Europe and Siberia to Canada.

15. A. TENUISSIMUM, *L.* Pekin, *Dr. Cantor !, Dr. S. Williams !* (*Hance*, 11463). A Siberian species, of which *A. anisopodium* of Ledebour can scarcely be counted more than a variety.

16. A. STOCKSIANUM, *Boiss. Diag.*, ser. 2, p. iv., p. 117. Afghanistan, *Griffith*, 5824 ! ; Beloochistan, *Stocks*, 993 !. A very distinct dwarf species, with rather large bright red flowers, the bulbs coated with a dense mass of fine distinct pale brown fibres.

* * Leaves narrow flattened.

(Group of *A. angulosum*, Linn.)

* Stamens included.

17. A. SIKKIMENSE, *Baker, n.sp.* Bulbi graciles elongati cylindrici, fibris radicalibus gracilibus, tunicis exterioribus in fibras parallelas solutis. Folia 2-3 crebre superposita anguste linearia glabra canaliculata 3-4 poll. longa, 1-1½ lin. lata scapo breviora. Scapus 3-6-pollicaris gracilis flexuosus teres. Spatha univalvis brevis late ovata. Umbella 6-15-flora densa pedicellis inæqualibus 1-3 lin. longis. Perianthium campanulatum 3 lin. longum segmentis lilacino-purpureis oblongis obtusis vel subacutis. Stamina perianthio triente breviora,

filamentis lilacinis subulatis basi lanceolatis. Ovarium globosum, stylo 1½ lin. longo incluso, ovulis in loculo binis. Sikkim, 14,000 ft., *Dr. Hooker!* (Hk. fil. and Thoms. no. 13.). 9,10 Intermediate in general character between the smaller varieties of *angulosum* and *Schœnoprasum*.

18. A. SEMENOVII, *Regel, Enum. Semenow.*, p. 126. Temperate and alpine region of the West Himalayas. Kashmir, *Falconer!*; Kistwar, 7-10,000 ft., *Thomson!* (Hk. fil. and Thomson, no. 13); between Baltul and Dras, *Dr. Henderson!* (Yarkand expedition); Garwhal, 11-12,000 ft., *Strachey and Winterbottom!*. This is a very striking plant, gathered also by Semenow in Mongolia, with dense head of flowers, like those of *Schœnoprasum*, but bright yellow, 2-3 stout leaves ¼-½ inch broad, and very long cylindrical cæspitose bulbs. It has been long known to Indian botanists, but never named.

19. A. GOVANIANUM, *Wall. Cat.*, no. 5071—A. humile, *Kunth Enum.*, iv., 443—A. nivale, *Jacquem. MSS.* Temperate and alpine region of West and Central Himalaya. Kumaon on Mount Chor, *Gavan and Royle!*, *Edgeworth!*; Bactal, 8-12,000 ft., *Dr. Thomson!* (distributed by Hk. fil. and Thomson as *A. nivale*). Garwhal, 11,000 ft., *Strachey* and *Winterbottom!*; Simla, *Webb!*; Kashmir, *Falconer*, 1099! 1107! (a dwarf alpine form). South side of Rotary Pass, *Jæschke*. Pir Panjal, *Jacquemont*, 533. An endemic Himalayan species, well described by Kunth from dwarfed specimens. It is closely allied to *odorum* in bulb, leaves and flowers, but the segments of the perianth are less spreading.

20. A. MACRANTHUM, *Baker, n. sp.*—Bulbus ignotus. Folia 3. Crebre suprabasalia anguste linearia erecta glabra canaliculata acuta 6-9 poll. longa 1½ lin. lata. Scapus anceps gracilis sub-pedalis. Spatha caduca, umbella laxe 3-12-flora, pedicellis apice cernuis 6-9 lin. longis. Perianthium saturate purpureum 4-5 lin. longum segmentis oblongis obtusis 2 lin. lātis diutine imbricatis, linea dorsali saturatiori. Filamenta ad basin subulata, segmentis vix breviora. Ovarium globosum minutum. Stylus 4-5 lin. longus exsertus, apice stigmatoso capitato. Sikkim near Lachen, alpine region, 13,000 feet, *Dr. Hooker*, No. 9!. For the want of bulbs and spathes in the three only examples this cannot be fully described; but so far as material goes it closely resembles *A. narcissifolium*, Vill., of Dauphiné and Piedmont, the handsomest of all our European species.

* * Stamens exserted. Flowers yellow.

21. A. CONSANGUINEUM, *Kunth Enum.*, iv., p. 431.—Kashmir, 10,000 feet, *Jacquemont* 982!, *Thomson!* (Hk. fil. and Thomson, No. 17). Represents, as already indicated by Kunth, the European *A. ochroleucum* and *suaveolens*.

* * * Stamens exserted. Flowers red.

22. A. RUBENS, *Schrad.*, *Kunth Enum.*, iv., 427—A. lilacinum, *Royle, Ill. Him.*, p. 392 (*nomen solum*). West Himalayas, temperate region, *Royle!*, *Falconer* 1100! Mussooree 6-7000 feet, *Edgeworth!*; A Siberian species, often grown in botanic gardens.

23. A. STRACHEYI, *Baker, n.sp.*—Bulbi cæspitosi anguste ovoidei tunicis exterioribus griseis obscure fibrosis supra collum longe pro-

ductis. Folia 3-4 crebre superposita anguste linearia glabra canaliculata pedalia 1 lin. lata. Scapus gracilis pedalis flexuosus superne anceps. Spathæ valvæ 2 parvæ deltoideæ. Flores 6-20 in umbellam globosam congesti, pedicellis 1-3 lin. longis. Perianthium oblongo-campanulatum 2-2½ lin. longum saturate rubro-purpureum, segmentis oblongis obtusis diutine imbricatis. Stamina perianthio sesqui longiora, filamentis lineari-subulatis, antheris oblongis rubellis. Ovarium globoso-trigonum, ovulis in loculo binis. Stylus 2-2½ lin. longus simplex. Kumaon, 12,000 feet, *Strachey* and *Winterbottom!*; Budrinath, 10-11,000 feet, *Edgeworth!*. Habit completely of the last, from which it differs by its much exserted genitalia. Royle mentions by name an *Allium longistamineum* from Kunawar, of which I have not been able to see specimens.

24. A. LONGISTYLUM, *Baker*, *n.sp.*—Bulbum non vidi. Folia 4 per dimidiam inferiorem caulis longe superposita plana glabra anguste linearia semipedalia 1½ lin. lata. Caulis strichis pedalis superne multiangulatis. Spathæ valvæ 2 parvæ deltoideæ. Flores 20-30 in capitulam globosam 1 poll. crassam conferti. Pedicelli 3-4 lin. longi. Perianthium roseum campanulatum 2 lin. longum segmentis oblongis obtusis diutine imbricatis. Stamina perianthio duplo longiora, filamentis simplicibus lineari-subulatis. Stylus 3 lin. longus, ovarium ovoideum 5-6-plo superans. China borealis in itinere inter Pekin et Jehol, *Sir G. Staunton, in Herb. Mus. Brit.* General habit of Indian *Stracheyi*, from which it differs by its distantly superposed leaves and longer genitalia.

25. A. EXSERTUM, *Baker*.—Caloscordum exsertum, *Herbert, Bot. Reg.*, xxxiii., *sub t.* 5.—Allium splendens, *Miquel, Ann. Mus., Lug. Bat.*, iii., 154, *non Willd.* Bulbi ovoidei cæspitosi tunicis exterioribus albis membranaceis. Folia 2-4 basalia erecta anguste linearia 6-9 poll. longa, 1 lin. lata. Scapus ½-1 pedalis gracilis teres. Spathæ valvæ 2 parvæ deltoideæ. Umbella laxe 6-30 flora, pedicellis 4-9 lin. longis apice turbinatis. Perianthium saturate rubro-purpureum globoso-campanulatum, segmentis oblongis obtusis 2-2½ lin. longis, late imbricatis. Stamina perianthio sesqui longiora, filamentis lineari-subulatis, antheris minutis oblongis. Stylus integer longe exsertus. Capsula perianthio æquilonga, seminibus in loculo 1-2. China, in ditione Kiangsi, *Sir G. Staunton, in Herb. Mus. Brit.!*; Japan, *Oldham* 422!; Chusan, *Fortune* 102!; Shantung, *Maingay!*; Assam, *Mrs. Mach!*; Khasia, 4-5000 feet, *Griffith* 5833!; *Hk. fil. and Thomson, no.* 8!, *T. Lobb.* Nearest the last, but different by its basal leaves, lax umbel, &c.

26. A. THOMSONI, *Baker*, *n.sp.*—Bulbi obliqui cæspitosi ovoideo-cylindrici, tunicis exterioribus duris castaneis. Folia 4-5 per tertiam inferiorem caulis superposita glabra linearia carnosa obtusa 6-9 poll. longa 2-3 lin. lata. Scapus teres 1-2 pedalis rectis modice crassus. Spathæ valvæ albæ deltoideæ, umbella breviores. Flores 30-60 in umbellum globosum conferti, pedicellis 1-4 lin. longis. Perianthium oblongo-campanulatum 2½-3 lin. longum saturate rubro-purpureum segmentis oblongo-lanceolatis acutis diutine imbricatis. Stamina perianthio sesqui longiora filamentis lineari-subulatis, antheris minutis oblongis. Ovarium globosum ovulis in loculo 2. Stylus longe exsertus. West Tibet and Kashmir 8-14,000 feet, *Dr. Thomson!* (Hk. fil.

and Thoms., No. 19), *Lance* 279 !. Differs from the next in its more slender habit, narrower leaves, and longer, more acute perianth-segments.

27. A. BLANDUM, *Wall., Pl. Asiat. Rar. t.* 260, *Kunth, Enum.*, iv., 396. Alpine region of Tibet, 14-17,000 feet, *Dr. Thomson !*—distributed as "A. nutans ?"—*Strachey and Winterbottom !;* Piti, *Jacquemont !;* Lahul, *Jæschka !*. Between Dras and Bactul, *Henderson !*, gathered also by Falconer 1105. A well-marked endemic Himalayan species near *senescens*.

Group 5. MICRODON.

28. A. AURICULATUM, *Kunth, Enum.*, iv., 418. Kunawar, *Jacquemont* 1528 !. Very near the European *A. strictum*, Schrad.

29. A. JUNCEUM, *Jacquem. MSS.*—A. stenophyllum., *Wallr., Cat.* 5073 *B*. Bulbi cæspitosi elongati subcylindrici fibris pilosis densis intricatis rubellis vestiti. Folia 3-6 erecta basalia subteretia glabra persistentia ½ lin. lata 4-6 poll. longa. Scapus strictus teres gracilis 3-9 pollicaris. Spathæ valva unica parva caduca deltoidea. Flores 20-40 in umbellam globosam congesti, pedicellis 1-3 lin. longis. Perianthium lilacinum campanulatum 2-2½ lin. longum, segmentis oblongo-lanceolatis obtusis vel subacutis. Stamina breviter exserta, filamentis purpureis subulatis basi deltoideis, interioribus obscure dentatis. Capsula obovoideo-globosa apice umbilicata. Stylus longe exsertus. Tibet, alpine region, 12,000-16,500 feet, *Thomson !*, *Henderson !; Strachey and Winterbottom !;* Piti, *Jacquemont !;* Ladak, *Aitchison !;* Simla, *Lady Sarah Amherst, in Herb. Wallich !*. May be a variety of Siberian *A. lineare*, L. Dr. Aitchison thus describes its use: "Grows largely on the high hills of Ladak and used by the natives. It is sold in the bazaars in the shape of balls, the whole plant being mashed up into a semi-pulp and then made into a a ball as big as the fist, to be used as a condiment. The balls are strung through the middle and carried on a string." (See also Royle Illust., p. 392-3.)

30. A. ASCALONICUM, L.—A. Sulvia., *Hamilt., in D. Don Prod. Nep.* 53.—Nothoscordum ? Sulvia, *Kunth, Enum.*, iv., 462. Bengal, *Griffith* 5817 !; Punjaub, *Aitchison* 548 !. Probably in both cases cultivated only. Differs from the other Microdons by its more spreading perianth-segments.

31. A. CEPA, *Linn., Wall. Cat.*, 2072. Beloochistan: "Wild on Chehil Tun," *Stocks*, 1033 !; Afghanistan, *Griffith* 5823 !; Lahore, *Thomson*. Concan, *Stocks !;* and seen from several other collectors, none of whom give it expressly as indigenous.

Besides these, *Allium Porrum*, which in my view is simply the cultivated condition of *Allium Ampeloprasum*, is contained in the Wallichian Herbarium as No. 5074, from specimens gathered in Kumaon by Blinkworth.

NORTH OR LAKE LANCASHIRE; A SKETCH OF ITS BOTANY, GEOLOGY, AND PHYSICAL GEOGRAPHY.

BY MISS E. HODGSON.

(*Concluded from page* 277.)

Sedum purpureum, *Tausch.* In a wall near Haverthwaite.

S. anglicum, *Huds.* Hills above the town, Ulverston; on rocks everywhere, Seathwaite Fells.

S. acre, *Linn.* Walls, frequent, from shores upwards.

S. reflexum, *Linn.* On an old garden wall, Newfield, Seathwaite.

S. rupestre, *Huds.* Walls, Broughton in Furness (introduced).

Cotyledon umbilicus, *Linn.* Long observed on an old wall at Arrad Foot, near Ulverston; (originally introduced?)

Saxifraga stellaris, *Linn.* Wrynose, a little to the south of the Three Shire Stones. 1250. Walna Scar. 1225. Gr. Sl. and Por.

S. aizoides, *Linn.* Cockley Beck Fell, near the copper mines. 700. Gr. Sl. and Por. (*Trap Ash?*.) (Miss Park.) Abundant on Dobby Shaw, Dunnerdale Fells. 8 or 900. Gr. Sl. and Por.

S. granulata, *Linn.* Dragleybeck wood, Ulverston.

S. tridactylites, *Linn.* Walls, frequent.

Chrysosplenium oppositifolium, *Linn.* Frequent in rills.

C. alternifolium, *Linn.* Kirkby. [Mrs. Wannop.] rare.

Adoxa Moschatellina, *Linn.* Not unfrequent in hedge banks; with two terminal flowers, near Soutergate, Kirkby.

Hedera Helix, *Linn.*

Hydrocotyle vulgaris, *Linn.*

Sanicula europæus, *Linn.*

Eryngium maritimum, *Linn.* Furness shores at Roosebeck; Isle of Walney.

Apium graveolens, *Linn.* Saltmarsh, Plumpton.

Helosciadium nodiflorum, *Koch.* Not unfrequent in brooks.

Ægopodium Podagraria, *Linn.* In an orchard at Dendron, near Aldingham; roadside near the far lodge gate, Conishead Priory.

Conopodium denudatum, *Koch.*

Pimpinella Saxifraga, *Linn.* Hampsfield Fell. 400. M. Lime; Furness shores at Bardsea and Roosebeck.

Sium angustifolium. *Linn.*

Œnanthe Lachenalii, *Gmel.* Humphrey Head marsh, Cartmel.

Œ. crocata, *Linn.* Brooks, frequent.

Angelica sylvestris, *Linn.*

Heracleum Sphondylium, *Linn.*

Daucus Carota, *Linn.*

——maritimus, *With.* Plumpton shore cliff.

Torilis anthriscus, *Gærtn.*

Anthriscus sylvestris, *Hoffm.*

Chærophyllum temulum, *Linn.*

Myrrhis odorata, *Scop.* Frequent near old halls and farmhouses.

Sambucus nigra, *Linn.* Woods and hedges, frequent.

Viburnum Opulus, *Linn.* Woods and hedges, frequent.

Lonicera Periclymenum, *Linn.*
Galium verum, *Linn.*
G. cruciatum, *With.*
G. palustre, *Linn.*
——Witheringii, *Sm.*
G. saxatile, *Linn.*
G. Mollugo, *Linn.*
G. sylvestre, *Poll.* Hampsfield Fell.
G. Aparine, *Linn.*
Sherardia arvensis, *Linn.*
Asperula odorata, *Linn.*
A. cynanchica, *Linn.* Hampsfield Fell.
Valeriana dioica, *Linn.* Wet woods and swampy ground, not unfrequent.
V. officinalis, *Linn.*
——sambucifolia, *Mik.*
Valerianella olitoria, *Mœnch.* Shores, not unfrequent.
V. dentata, *Koch.* Cultivated fields.
Dipsacus sylvestris, *Linn.* White Ghyll wood, near Ulverston. [The Misses Ashburner.]
Scabiosa succisa, *Linn.* [White flowers on Ulverston peat mosses.]
S. columbaria, *Linn.*
Knautia arvensis, *Coult.*
Leontodon autumnalis, *Linn.*
Hypochæris radicata, *Linn.*
Lactuca virosa, *Linn.*
L. muralis, *D.C.* Roadsides Grange, over sands.
Sonchus arvensis, *Linn.*
S. asper, *Hoffm.*
Hieracium Pilosella, *Linn.*
H. vulgatum, *Fries.*
H. boreale, *Fries.*
Taraxacum officinale, *Wigg.*
——lævigatum, *DC.* Sandhills, north end, Isle of Walney.
Lapsana communis, *Linn.*
Arctium Lappa, *Linn.*
——minus, *Schkuhr.* Roadside, Bigland Hill; roadsides above Penny Bridge.
——pubens, *Bab.* Roadside, Bigland Hill; Furness shores at Bardsea Hills.
Serratula tinctoria, *Linn.* Hills east of Backbarrow. 500.
Carduus tenuiflorus, *Curt.* Top of Humphrey Head.
C. lanceolatum, *Linn.*
C. palustris, *Linn.*
C. arvensis, *Curt.*
C. heterophyllus, *Linn.* Near Newby Bridge.
Carlina vulgaris, *Linn.*
Centaurea nigra, *Linn.*
——nigrescens, *Willd.* (?) Roadside east bank of River Crake.
C. Scabiosa, *Linn.* Furness shores at Roosebeck.
Bidens cernua, *Linn.* Peat ditches, Plumpton.
Eupatorium cannabinum, *Linn.*
Artemisia Absinthium, *Linn.* Lindeth wood, Rusland.
A. vulgaris, *Linn.*
Gnaphalium dioicum, *Linn.* Highest ridge of Cartmel Fell; Dunnerdale Fells.
G. sylvaticum, *Linn.* Hillsides not unfrequent. Con. Grits. M. Lime.
——rectum, *Sm.* Lindeth wood, near Pool Bridge.
G. uliginosum, *Linn.*
Filago minima, *Fries.* Walltops north and south of Ulverston; on Foxfield marsh.
F. germanica, *Linn.* Jacklands, Low Furness, abundant; Roose beck. [Miss M. A. Ashburner.]
Petasites vulgaris, *Desf.* Margins of becks, not uncommon.
Tussilago Farfara, *Linn.*
Aster Tripolium, Linn. Morecambe shores at Greenodd; Dunnerholme; Foxfield marsh; &c.
Solidago Virgaurea, *Linn.* Woods frequent; Caw rocks, Dunnerdale Fells.
Senecio vulgaris, *Linn.*

S. Jacobæa, *Linn.*

S. aquaticus, *Huds.*

S. saracenicus, *Angl.* Corner of a field, Old Hall estate, Ulverston.

Inula Conyza, *DC.* Waste places near Newland; &c.

Bellis perennis, *Linn.*

Chrysanthemum segetum, *Linn.*

C. Leucanthemum, *Linn.*

C. Parthenium, *Pers.* . Face of rocks, Furness Abbey.

C. Tanacetum, *Syme.* Bardsea, doubtfully wild there.

C. inodorum, *Linn.* Cultivated fields.

——maritimum, *Pers.* Shores from Grange westward.

Anthemis arvensis, *Linn.*

Achillea Ptarmica, *Linn.*

A. Millefolium, *Linn.*

Campanula rotundifolia, *Linn.*

C. latifolia, *Linn.* Lindale hill, near Ellerbow, Cartmel. [Mr. J. K. Hodgson.] Bigland woods; wet hedges about Stoney Crag, Ulverston.

Jasione montana, *Linn.* Wall tops Bouth, Rusland; Penny Bridge lanes.

Lobelia Dortmanna, *Linn.* Head of Coniston Lake.

Erica Tetralix, *Linn.*

E. cinerea, *Linn.*

Calluna vulgaris, *Salisb.*

Andromeda polifolia, *Linn.* Angerton moss. [Rev. F. Malleson]; Ireland moss; Roam moss; Stockbird moss; on all the good peat tracts between Ulverston and Haverthwaite.

Vaccinium Myrtillus, *Linn.*

V. Oxycoccus, *Linn.* Kirkby Moor.

Ilex Aquifolium, *Linn.* Woods and hedge rows, rarely flowering in the latter.

Ligustrum vulgare, *Linn.* Fine old trees overhanging a ghyll, Penny Bridge; everywhere on the Plumpton rocks, both in the woods and facing the shore.

Fraxinus excelsior, *Linn.*

Vinca minor, *Linn.* Legbarrow wood, but near a cottage.

Gentiana Amarella, *Linn.* Hampsfield Fell.

G. campestris, *Linn.* Drylands, Isle of Walney; Newfield, Seathwaite. [Mrs. Hodgson.]

Erythræa Centaurium, *Pers.* Marsh lands not unfrequent.

E. littoralis, *Fries.* Shore under Humphrey head; Plumpton salt marshes.

E. pulchella, *Fries.* Low lying pastures near Green Hills, Plumpton. 25.

Menyanthes trifoliata, *Linn.* Rowdsey wood; Urswick Tarn; near the Three Shire stones about springs of the Brathay, but out of reach in bog. 1270.

Convolvulus sepium, *Linn.* Hedges and woods not unfrequent.

C. Soldanella, *Linn.*

C. arvensis, *Linn.* Tridley Marsh.

Solanum Dulcamara, *Linn.* Not unfrequent in hedge rows.

——marinum. Drylands, Isle of Walney.

Atropa Belladonna, *Linn.*

Verbascum Thapsus, *Linn.*

V. virgatum, *With.* Roosebeck. [Mr. R. Ashburner.]

Veronica spicata, *Linn.*

V. arvensis, *Linn.*

V. serpyllifolia, *Linn.*

V. Anagallis, *Linn.* Bardsea mill-pond; Lightburn Park, Ulverston: not common.

V. Beccabunga, *Linn.*

V. officinalis, *Linn.* Frequent; corolla pink on Cartmel Fell.

V. Chamædrys, *Linn.*

V. agrestis, *Linn.*
Bartsia Odontites, *Huds.*
Euphrasia officinalis, *Linn.*
——gracilis, *Fries.* Near Goats water. [Mr. J. K. Hodgson.] Mungeon, Cartmel; purple flowered.
Rhinanthus Crista-galli, *Linn.*
Melampyrum pratense, *Linn.*
Pedicularis palustris, *Linn.*
P. sylvatica, *Linn.*
Scrophularia nodosa, *Linn.*
Digitalis purpurea, *Linn.* Old Hall hedges; also near Haverthwaite; corolla white; Rosshead fields, dialysis of the corolla.
Linaria vulgaris, *Mill.* Not uncommon in hedge rows and woods.
Mimulus luteus, *Linn.* Bardsea mill-pond, but near gardens.
Verbena officinalis, *Linn.* Near Newland, Ulverston. Bann. 81.
Mentha aquatica, *Linn.* Common.
——hirsuta, *Linn.* Plumpton, Ulverston.
M. sativa, *Linn.* Wet meadows by Little Langdale Tarn; a form very near *rubra* found by the edge of the river Crake.
M. arvensis, *Linn.* Stubble-fields, Pennington; and other places.
Thymus Serpyllum, *Linn.*
Origanum vulgare, *Linn.*
Calamintha Clinopodium, *Spenn.*
Teucrium Scorodonia, *Linn.*
Ajuga reptans, *Linn.*
Lamium album, *Linn.* Generally found near habitations.
L. purpureum, *Linn.*
L. incisum, *Willd.* By Seawood farm-house, Bardsea.
Galeopsis Tetrahit, *Linn.*
Stachys Betonica, *Benth.*
S. palustris, *Linn.*
S. sylvatica, *Linn.*
S. arvensis, *Linn.*
Nepeta Glechoma, *Benth.*
Marrubium vulgare, *Linn.* By Jacklands Tarn.
Prunella vulgaris, *Linn.*
Myosotis palustris, *Linn.* River sides; edges of ponds; peat trenches.
M. repens, *Don.* On Legbarrow, near Penny bridge; Cartmel Fell; Walna Scar, above the quarries.
M. arvensis, *Hoffm.*
M. versicolor, *Lehm.* On walls, Colton.
Lithospermum officinale, *Linn.* About Plumpton; on the beach at Bardsea.
Mertensia maritima, *Don.*
Borago officinalis, *Linn.* Waste ground about Aldingham.
Lycopsis arvensis, *Linn.*
Anchusa sempervirens, *L.* On rubbish heaps, Swarthmoor Hall.
Cynoglossum officinale, *Linn.* In places by the shores.
Pinguicula vulgaris, *Linn.* About springs on the hills; Three Shire stones; peat mosses, Plumpton.
Utricalaria vulgaris, *Linn.* Urswick Tarn.
Primula vulgaris, *Huds.*
——hybrids, and double corollas, frequent in woods, especially on limestone.
P. veris, *Linn.*
Hottonia palustris, *Linn.* Bardsea mill-pond.
Lysimachia vulgaris, *Linn.* Wet hedges near Urswick Tarn; Brathay woods near the lake.
L. Nummularia, *Linn.* Bardsea mill-pond; Pullwyke, near Brathay Hall. [Mr. Stalker.]
L. nemorum, *Linn.* Woods near Graythwaite; Old Hall wood, Ulverston.
Anagallis arvensis, *Linn.* Frequent. Roosebeck (purp-

lish blue), [Mr. Robert Ashburner, jun.]; (reddish brown), wall tops, Colton.

A. tenella, *Linn.* Little Croft Park; Lightburn at the spring; peat mosses, Ulverston; Gillbanks, Ulverston.

Samolus Valerandi, *Linn.* Several places along the Plumpton shore, between the canal foot and Tridley Point.

Glaux maritima, *Linn.* Salt-marshes, Plumpton, to Isle of Walney.

Armeria maritima, *Auct.* Salt-marshes, frequent.

Statice Limonium, *Linn.* Once frequent about the shore at Salthouse, near Barrow in Furness.

S. Bahusiensis, *Fries.* On the slate rocks, Greenodd shore.

S. binervosa, *G. E. Sm.* Salt-marsh between Tridley and Greenodd, abundant.

Plantago major, *Linn.*

P. lanceolata, *Linn.*

P. maritima, *Linn.* Pool Bridge, Rusland; on the beach at Grange.

P. Coronopus, *Linn.* Round the shores of Isle of Walney.

Chenopodium album, *Linn.*

C. Bonus-Henricus, *Linn.*

Atriplex Babingtonii, *Woods.* Morecambe shore at Greenodd; Roosebeck, half buried in sand.

A. hastata, *Linn.* Near Urswick Tarn.

A. patula, *Linn.*

——angustifolia, *Sm.* Shores at Humphrey head and Roughholme.

Salsola Kali, *Linn.* Roosebeck shores. [Miss M. A. Ashburner.]

Suæda maritima, *Dum.* Plumpton salt-marsh. [Miss M. A. Ashburner.]

Salicornia herbacea, *Linn.*

——procumbens, *Sm.* Salt-marsh at Greenodd; salt-marsh at Foxfield on the Duddon.

Polygonum Bistorta, *Linn.* Not unfrequent in damp meadows.

P. amphibium, *Linn.* Urswick Tarn, leaves floating.

——terrestre. Near Urswick Tarn; Plumpton hedges, stem four feet high.

P. lapathifolium, *Linn.* Cultivated fields, also in woods, frequent.

P. Persicaria, *Linn.*

P. Hydropiper, *Linn.* Woods, plantations, peat mosses, frequent.

P. aviculare, *Linn.*

P. Convolvulus, *Linn.*

Rumex crispus, *Linn.*

R. obtusifolius, *Auct.*

R. Acetosa, *Linn.*

R. Acetosella, *Linn.*

Daphne Mezereum, *Linn.* Said to have been found by wood-cutters in Colton woods, and replanted in their cottage-gardens; a single root was found in a thicket near Mansriggs Hall, but very doubtfully wild.

Empetrum nigrum, *Linn.* Kirkby moor.

Euphorbia Helioscopia, *Linn.*

E. Cyparissias, *Linn.* By Jacklands Tarn. [Since completing my list for the press, I have been informed that this old clay-pit once belonged to a gardener.]

E. Peplus, *Linn.*

Mercurialis perennis, *Linn.*

Urtica dioica, *Linn.*

Parietaria officinalis, *Linn.*

——diffusa, *Koch.* Old limestone walls near Ulverston; Humphrey head.

Humulus Lupulus, *Linn.* In hedges and on rubbish by beck sides, but seldom seen far from houses.

Ulmus montana, *Sm.* Woods, hedges, and plantations frequent.

Quercus Robur, *Linn.*

——pedunculata, *Ehrh.* Woods, hedges, and plantations, frequent.

Fagus sylvatica, *Linn.* Woods, hedges, and plantations.

Corylus Avellana, *Linn.*

Alnus glutinosa, *Linn.* Wet woods and hedges, frequent.

Betula alba, *Linn.* Woods, hedges, and plantations

——pubescens, *Ehrh.* Bogs at Stribers, near Haverthwaite.

Castanea vulgaris, *Lam.* Large tree bank of river Crake, near the mill; two trees seen in Yewdale.

Populus alba, *Linn.* Graythwaite woods.

P. tremula, *Linn.* A very old looking, weather-beaten tree on Plumpton peat moss.

P. nigra, *Linn.* Half a mile from the *tremula* station, near the peat-moss; elsewhere frequently planted.

Salix pentandra, *Linn.* Occasionally seen from Isle of Walney to Dunnerdale Fells.

S. fragilis, *Linn.* Foxfield on the Duddon; side of Yewdale beck; Colton beck Bridge; a very fine tree near Greenodd, another on Plumpton ground, but scarcely a common willow.

S. alba, *Linn.* High Tilberthwaite. 500. Hill Top fields, Ulverston.

S. purpurea, *Linn.* By the canal-feeder, Ulverston.

S. viminalis, *Linn.* Common hedge-row willow, in low damp grounds.

S. Smithiana, *Willd.* By the canal-feeder; Lishman's lane, Ulverston; Newland vale, near Ulverston.

——rugosa, *Sm.* Lawyers wood, Ulverston.

S. cinerea, *Linn.* This with its three varieties is very common from Isle of Walney to the north confines of Lancashire.

S. aurita, *Linn.* Hedge rows on higher grounds.

S. caprea, *Linn.* As common as cinerea.

S. repens, *Linn.* Isle of Walney frequent; Greenscow. [Mr. J. K. Hodgson.]

Myrica Gale, *Linn.* Seathwaite Fells, abundant; on all the peat mosses of lower grounds.

Pinus sylvestris, *Linn.* Plantations.

Juniperus communis, *Linn.* Moors and hills, frequent.

——nana, *Willd.* Dobby Shaw, Dunnerdale Fells; top of Humphrey head.

Taxus baccata, *Linn.* In the old woods of Plumpton and Rowdsey.

Spiranthes autumnalis, *Rich.* On the limestone common near Baycliff, S.W. of Ulverston. [Rev. R. Rolleston.]

Neottia Nidus-avis, *Rich.* Rowdsey wood. This good old botanical ground has become of late years almost devastated by innumerable picnic parties resorting thither in quest of the lily of the valley, and the fly orchis, roots of the latter being taken by fifties. It is at length closed against the public.

Listera ovata, *Br.*
Orchis Morio, *Linn.*
O. mascula, *Linn.*
O. latifolia, *Linn.*
O. maculata, *Linn.*
O. conopsea, *Linn.*
Habenaria bifolia, *Br.*
——chlorantha, *Bab.* The more usual form.
H. viridis, *Br.* On limestone or clayey ground, not unfrequent.
H. albida, *Br.* About Newfield, Seathwaite; many places along the rocky banks of the Duddon.
Ophrys muscifera, *Huds.*
Iris Pseudacorus, *Linn.*
Crocus vernus, *Linn.* Covering whole meadows near old halls.
Narcissus *biflorus*, *Curtis.* Near old halls.
N. pseudo-narcissus, *Linn.* Very abundant in many places.
Galanthus nivalis, *Linn.* Near houses and old halls.
Allium Scorodoprasum, *Linn.* Plentiful at the old station Pool bridge, Rusland, where it covers a considerable part of a meadow bordering the pool or estuary; it is liable to be mown down with the hay before flowering.
A. Schœnoprasum, *Linn.* Nearly gone from the old station on Cartmel Fell, the result of drainage probably; but abundant higher up in a bog remote from the road.
A. ursinum, *Linn.*
Ornithogalum umbellatum, *Linn.* Orchards.
Hyacinthus non-scriptus, *Linn.* Vars.: white and rose-coloured, Beckside wood, near Ulverston. [Mrs. Jackson.]
Narthecium ossifragum, *Huds.* Boggy spots on the hills, frequent.
Asparagus officinalis, *Linn.* I gathered leaf-specimens of this on the shore rocks at Grange; but owing to these rocks being often sanded up, I have not again seen it in the flowering time.
Convallaria majalis, *Linn.* Near the Park, N.W. of Dalton. [Mrs. Hart Jackson.]
Paris quadrifolia, *Linn.* Frequent in woods.
Tamus communis, *Linn.* Seawood near Bardsea. [Mr. James Hodgson.] Road sides above Grange; face of Humphrey head; Plumpton woods; Legbarrow, near Penny Bridge.
Elodea canadensis, *Rich.* Foot of Windermere, at Newby Bridge, entangled with *Ranunculus peltatus.*
Alisma Plantago, *Linn.*
A. ranunculoides, *Linn.* Peat ditches, Plumpton.
Triglochin maritimum, *Linn.* Shores from Plumpton to Greenodd; under Humphrey head; Grange shore rocks.
T. palustre, *Linn.* Pool Bridge; frequent in wet meadows.
Potamogeton crispus, *Linn.*
——polygonifolius, *Pourr.* Very frequent.
——fluitans. Kirkby moor.
Lemna minor, *Linn.*
Arum maculatum, *Linn.* Hedge banks, frequent.
Sparganium simplex, *Huds.* In a spring by Humphrey head.
S. ramosum, *Huds.* Urswick Tarn; Drylands, Isle of Walney.
Typha angustifolia, *Linn.* Urswick Tarn. [I am much indebted to Mrs. Satterthwaite, and her sister

Miss Neale, of Urswick; as also to Mrs. and Miss Jackson for their combined help in securing the almost unreachable plants of Urswick Tarn.]

Juncus communis, *Mey.*

——conglomeratus, *Linn.* Frequent.

——effusus, *Linn.* Frequent.

J. glaucus, *Sibth.* Frequent.

J. maritimus, *Sm.* Humphrey head salt marsh.

J. acutiflorus, *Ehrh.* Frequent.

J. lamprocarpus, *Ehrh.* Frequent.

J. obtusiflorus, *Ehrh.* Furness shores, at Greenodd.

J. supinus, *Moench.* Frequent.

J. bufonius, *Linn.* Frequent.

J. squarrosus, *Linn.* Frequent.

Luzula sylvatica, *Bich.* Colton beck wood; Old Hall wood.

L. campestre, *Willd.*

L. multiflora, *Lej.* Grassy knolls and hills, frequent.

Rhynchospora alba, *Vahl.* Birks Bridge, Seathwaite; spongy bogs, Rumpton.

Scirpus lacustris, *Linn.* Urswick Tarn.

S. maritimus, *Linn.* Pool Bridge.

S. palustris, *Linn.* Mill-pond, Bardsea; Urswick Tarn.

S. pauciflorus, *Lightf.* Plumpton salt marsh.

S. cæspitosus, *Linn.* Near Birks Bridge; and other places in Dunnerdale Fells.

Eriophorum vaginatum, *Linn.* Peat-bogs and marshes from head of Morecambe round to the Duddon; by Seathwaite Tarn.

E. polystachyon, *Linn.* Ireland, moss, near Haverthwaite.

——angustifolium, *Roth.* On Cartmel Fell; Newfield Seathwaite; Plumpton salt-marsh; Roam peat moss; Foxfield moss.

Carex stellulata, *Good.*

C. remota, *Linn.* Stoney Crag wet hedges.

C. arenaria, *Linn.* Biggar Bank, Isle of Walney.

C. disticha, *Huds.* Grassy slopes in front of Grange.

C. vulpina, *Linn.* Ditches near Humphrey head; Isle of Walney; near Pool Bridge.

C. teretiuscula, *Good.* Urswick Tarn.

C. vulgaris, Fries.

C. acuta, *Linn.* Urswick Tarn.

C. flava, *Linn.* Cartmel Fell; Seathwaite; Isle of Walney; banks of the Duddon; Walna Scar.

——lepidocarpa, *Tansch.* Bog between Earnse Point and North Scale, Walney; banks of the Duddon, Seathwaite; Yaud Mire, Dunnerdale Fells.

C. extensa, *Good.* Foxfield marsh.

C. pallescens, *Linn.* About Newfield, Seathwaite.

C. fulva, *Good.* Between North Scale and Earnse Point.

C. binervis, *Sm.* North side of Hoad, Ulverston; Mungeon, Cartmel.

C. panicea, *Linn.*

C. sylvatica, *Huds.* Old Hall wood.

C. glauca, *Scop.*

C. præcox, *Jacq.* Dry grassy knolls and hills, Ulverston.

C. hirta, *Linn.* Rough pastures, Isle of Walney.

C. vesicaria, *Linn.* Bull-coppice beck, Newfield.

C. paludosa, *Good.* Tridley Point salt marsh; Urswick Tarn.

Phalaris arundinacea, *Linn.* Mansriggs wood by the beck; Newland beck; Bardsea millpond; river Leven at Lowwood; scarcely to be regarded as very common.

Anthoxanthum odoratum, *Linn.*
Phleum pratense, *Linn.*
Alopecurus pratensis, *Linn.*
Agrostis canina, *Linn.* Under Flan Hill, Ulverston, on the roadside.
A. vulgaris, *With.*
——pumila, *Lightf.* Hedgeside Green Moor House lane, Pennington. 275. Hilly.
Ammophila arundinacea, *Host.* West coast of Walney; Morecambe shores at Roose beck.
Arundo Phragmites, *Linn.* Urswick Tarn; Humphrey head; hedges between Old Holebeck and Leece; ditch sides near Ulverston.
Aira cæspitosa, *Linn.* Walna Scar. 1400. Mansriggs wood; Colton Beck wood; Fell Foot, Windermere; by the Canal Feeder, Ulverston.
A. flexuosa, *Linn.* Walna Scar; Dobby Shaw; Birkdault quarry; near Haverthwaite; Old Hall Wood.
A. præcox, *Linn.* Everywhere on the crags, Dunnerdale Fells; and hilly districts nearer Ulverston.
Avena pubescens, *Linn.* South-end of Biggar Bank, Walney; near Park, Dalton.
A. flavescens, *Linn.* Hedges of cultivated fields near Ulverston.
Arrhenatherum avenaceum, *Beauv.* Hayfields, Ulverston.
Holcus lanatus, *Linn.* Frequent.
Triodia decumbens, *Beauv.* Between Horrace and High Rake, north-west of Ulverston. 750.
Melica uniflora, *Retz.* Woods, frequent.
Molinea cærulea, *Mœnch.* Angerton moss on the Duddon.
Glyceria fluitans, *Br.* Stoney-crag beck, in the meadow.
——plicata, *Fries.* Under Mary Bank, Dalton.
Poa annua, *Linn.* Walna Scar.
P. pratensis, *Linn.*
P. trivialis, *Linn.* Both frequent.
Briza media, *Linn.* Barren pastures amongst whin; undulated craggy ground above Penny Bridge, frequent.
Cynosurus cristatus, *Linn.* Low-lying peat ground, and hills frequent.
Dactylis glomerata, *Linn.*
Festuca ovina, *Linn.* West coast of Walney.
F. pratensis, *Huds.* Cartmel Fell; about the Flan, Ulverston.
F. gigantea, *Vill.* Under Humphrey head; Colton Beck Bridge, in the wood.
Bromus sterilis, *Linn.* Rake lane, Ulverston.
B. mollis, *Linn.* Shores; and hilly woods.
Brachypodium sylvaticum, *Beauv.* Under Humphrey head; near Penny Bridge.
Triticum caninum, *Huds.* Mansriggs Wood.
T. repens, *Linn.* Colton Beck wood; beach at Bardsea.
T. junceum, *Auct.* Furness shores at Roose Beck.
Lolium perenne, *Linn.*
L. italicum, Braun. Old Hall wood, Ulverston.
Nardus stricta, *Linn.* Very frequent on the hills and fells.
Ceterach officinarum, *Willd.* Old walls about Newland; but it may be a question whether it was not originally introduced.
Polypodium vulgare, *Linn.*
P. Phegopteris, *Linn.* Occasionally seen in hedges, and ghylls; abundant in Rowdsey wood.
P. Dryopteris, *Linn.* Hedges

near Ulverston; Lawyers wood, Ulverston, but much dug up from former old stations.

P. Robertianum, *Hoffm.* Hampsfield Fell. [Mr. Ion Douthwaite.]

Allosorus crispus, *Bernh.* Sparingly on the slate hills above Ulverston; luxuriant on the fells.

Cystopteris fragilis, *Bernh.* In old walls and on commons; more abundant where the rock is limestone.

Polystichum aculeatum, *Roth.* In high old hedges of narrow lanes, Low Furness.

P. angulare, *Newm.* Sparingly near Ulverston, attaining greater luxuriance in ghylls and lanes further south, especially near Gleaston. [Mr. and Mrs. Hodgson.]

Lastrea Thelypteris, *Presl.* Rowdsey wood.

L. Oreopteris, *Presl.* Sparingly on the hills and moors; luxuriant on the fells.

L. Filix-mas, *Presl.* Typical form frequent everywhere.

—— Borreri, *Newm. Hist.* In shady hedges and woods, not scarce.

L. spinulosa, *Presl.* Rowdsey wood.

L. dilatata, *Presl.* Shady hedges and woods, frequent.

L. æmula, *Brack.* In some of the Kirkby moor ghylls which decline into the Duddon. [Mr. B. Waites and Mr. J. K. Hodgson.]

Athyrium Filix fœmina, *Roth.* Frequent in moist hedges and woods.

Asplenium viride, *Huds.* Goathwaite Moor slate quarries, and crags above. [Mrs. Woodburne, Thurstonville.]

A. Trichomanes, *Linn.* Rocks and old walls, frequent.

A. marinum, *Linn.* Ruins of Pile Castle, Pile Island, mouth of Morecambe.

A. Adiantum-nigrum, *Linn.* Attaining great luxuriance on shady walls; stunted on exposed rocks.

A. Ruta-muraria, *Linn.* Old walls, not common; limestone rocks, frequent.

Scolopendrium vulgare, *Sym.* Hedges, walls, and rock-fissures, very frequent.

Blechnum boreale, *Sw.* Sparingly in hedges and woods, abundant on damp fells.

Pteris aquilina, *Linn.*

Hymenophyllum Wilsoni, *Hook.*

Osmunda regalis, *Linn.* A good deal dug up by dealers from springs on the hills, Ulverston; Plumpton, low hedges; Rowdsey, ditches and woods.

Botrychium Lunaria, *Sw.* Rowdsey wood; Old Hall fields; and other ground with a clayey soil.

Ophioglossum vulgatum, *Linn.* On the clayey pasturages of Swarthmoor, near Ulverston, sparingly.

Lycopodium clavatum, *Linn.* Moors and fells, frequent.

L. alpinum, *Linn.* Moors and fells, less frequent.

L. Selago, *Linn.* Moors and fells.

Equisetum arvense, *Linn.*

E. palustre, *Linn.* Wet meadows, Plumpton; by the railway bridge, Tridley marsh.

E. limosum, *Linn.* Seathwaite Tarn. [Mrs. Hodgson.] Urswick Tarn.

—— fluviatile, *Linn.* Urswick Tarn Beck.

E. hyemale, *Linn.* In a wooded ghyll near Penny Bridge. [Mr. Gabriel Baini.]

Chara fragilis, *Desv.* Urswick Tarn.

SHORT NOTES.

A NEW STATION FOR ERICA MACKAYANA.—Hitherto this rare heath has been observed only in the vicinity of Craigga-more Hill, and thence westward along the road leading to Clifden. It will therefore be interesting to record a second Irish locality, which is situated about eight miles to the south of Craigga-more. On August 31st I found *Erica Mackayana*, in its most typical form, growing in moderate abundance a little east of the newly-built police barrack at Carna. Here it grows in fair quantity along the mountain heath on the way to Lough Sheedagh, and is, as usual, associated with *Erica Tetralix*. On the same ground I gathered some of the forms which appear intermediate between *E. Mackayana* and *E. Tetralix*, and which seem to give some reason for uniting the two plants. These intermediates are much more plentiful about Craigga-more and are very variable, forming, as it seems to me, a nearly complete series from *E. Tetralix* to *E. Mackayana*. I could not find any trace of *E. ciliaris* at Carna, though possibility of its occurrence there was kept in mind. *Aira uliginosa* extends, on the wet mossy bogs and margin of lakes, throughout Connemara, from Clifden to Oughterard; and *Juncus obtusiflorus* is its frequent companion. We found *Naias flexilis* again sparingly in Lough Creg-Duff, and, as before, in this lake only.—A. G. MORE.

NEW STATION FOR WOLFFIA ARRHIZA, *Wimm.*—I found this day (September 8th) in quantity on Barnes Common, in a ditch which bounds the heath to the north, and which ditch the Hammersmith road crosses at its point of contact with the common. Search the trench 100 yards westward of this spot. The *Wolffia* is associated with both *Lemna gibba*, L., and *L. polyrrhiza*, L. This station seems worth record as extending the range of the species in Surrey, as admitting of precise localisation, and as bringing *Wolffia* within easy reach of provincial botanists whose time in town is limited. One can reach the spot indicated above on foot from either Putney or Hammersmith Bridge under half an hour. Barnes Common yields other plants of interest—*Carex axillaris*, Good., *C. Pseudo-cyperus*, L., *Polygonum mite*, Schrank, *Teesdalia*, *Acorus*, *Catabrosa*, *Mentha Pulegium*, L., *Centaurea Calcitrapa*, L., and other nice things.—J. LEICESTER WARREN.

MALVA BOREALIS, *Wallm.*, IN EAST CORNWALL.—Last August I was surprised to find some dozens of plants of this Mallow close to the village of Antony, East Cornwall, about four miles from Plymouth. They were growing rather thickly together on each side of the entrance to a small court, on one side of which are some pig-styes, by the road leading from the village to Screasdon Fort. The spot is just similar to those in which *Malva rotundifolia* is generally seen about Plymouth; for here it is near human habitations that it is to be found, as Mr. Mansel-Pleydell says is likewise the case in Dorset. Possibly, however, *Malva borealis* was first brought to the locality with corn or some other food supplied to the horses employed on the works when Screasdon Fort was being erected several years ago. Syme says of this species in Eng. Bot., ed. 3, vol. ii., p. 169: "Said to have been found at Hythe, in Kent, in Hudson's time, and the figure in 'English Botany' was drawn from a plant raised from the seed of a specimen communicated by Hudson to Pelham.* The evidence for its occurrence is by no means satisfactory; but as it occurs in Scandinavia and North Germany, it is very likely to occur in Britain; while, on the other hand, from its great similarity to *M. rotundifólia*, it is extremely liable to be overlooked." Under these circumstances I cannot but think the present occurrence of the plant at Antony of considerable interest. It has quite the appearance of having been there at least some years.—T. R. ARCHER BRIGGS.

CALLITRICHE OBTUSANGULA, *Le Gal.*, IN SUSSEX.—I am able to connect the Kent and Wight records of this species by adding "brackish ditches three-quarters of a mile west of Lower Lancing, and about due south of where the ninth mile out of Brighton on the London, Brighton, and South Coast Railway is marked on the Ordnance map." I gathered the specimens in August last year, and till enlightened by Mr. Duthie's specimens from Deal (kindly given me by a friend), held this Lancing *Callitriche* to be extreme "*verna*." My specimens are intermixed with very decided *Zannichellia pedicillata*, Fries., which, added to our previous information about this plant's distribution in England, seems to indicate a littoral tendency.—J. L. WARREN.

AT a meeting of the Leeds Naturalists' Field Club and Scientific Association, on September 15th, Mr. James Abbott mentioned that he had gathered *Butomus umbellatus* in flower at Kirkstall, on September 12th. The plant had not been noted in the Leeds district for upwards of twenty years past, when it grew in a small stream at the foot of Batty Wood, Woodhouse Ridge.—W. DENISON ROEBUCK.

RUMEX SYLVESTRIS, *Wallr.*, IN HERTS. (See p. 280.)—I have again visited the locality in which *Rumex sylvestris* occurs, and found it in three places in the brickfield, which is a very large one. The plants noticed were typical *sylvestris*. It may be interesting to mention that *R. conglomeratus*, *R. Friesii*, *R. pratensis*, *R. crispus*, and *R. Hydrolapathum* grow in the same field. *R. conglomeratus* grows quite near to *R. sylvestris*, which gives some support to the view entertained by Meisoner, that the latter may be a hybrid.—THOMAS B. BLOW.

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* A misprint for "Relhan."—*Ed. Journ. Bot.*

ON THE STRUCTURE OF THE SEEDS OF THE *RAFFLESIACEÆ* AND *HYDNORACEÆ*.

BY H. COUNT SOLMS-LAUBACH.

(TAB. 151, 152.)

A MORE careful investigation of the *Rafflesiaceæ*, which recently devolved upon me in consequence of my having undertaken to monograph this group for Martius's Flora Brasiliensis, soon revealed the necessity for submitting the seeds of these plants to re-examination. Considering the imperfect knowledge we previously possessed of their structure, no other reason need be given in justification of laying the results of my researches before your readers, especially as some facts have come to light which may be of importance in determining the position of this family in a systematic arrangement.

Very little has been written on this subject, and the published information is exceedingly incomplete. By far the most important contribution is to be found in Robert Brown's second paper on *Rafflesia Arnoldi*,* wherein he fully describes the structure of the fruit. He rightly observes that the seed contains a few-celled embryo, lying enclosed within a thin coating of albumen. And, apparently on account of its structure not being clearly represented by Francis Bauer's drawing, an additional circumscribed figure was added to tab. xxv., to which the initials "R. Br." are appended, and which really deviates in unimportant particulars only from the actual condition of things. It even shows the more or less decided oblique direction of the embryo in the albumen. As the main object of the figure is to bring out the embryo prominently, it is scarcely to be wondered at that the endosperm of a single layer of cells of Francis Bauer is more accurately reproduced.

A few pages further on, in the same article, the embryo of *Hydnora* comes under consideration, and is correctly described as a small spherical body seated in the centre of the seed, and built up of numerous minute cells. But the long embryo cord, or cellular channel which connects it with the outer surface of the albumen, was overlooked.

Finally, Robert Brown failed to discover the embryo of *Cytinus*. He compares the whole mass contained within the testa of the seed to the homogeneous embryo of Orchids; not omitting, however, to mention the possibility of being deceived on account of the small size of the cellular bodies in question. Arguing from data furnished by De Candolle and Delisle, Brongniart † had already advanced the same opinion; and subsequent investigations by Planchon,‡ Link,§ Treviranus,[*] and myself were equally fruitless, so far as a correct solution of the facts was concerned. Weddell[†] produces something approaching a truthful representation of a cross section of the seed of *Rafflesia Arnoldi*, the only essential inexactness being in the endosperm. This figure indeed is only a proof of the precision of Brown's examination, for in the explanation of the plate it is stated to be *en partie théorique*, and in the text it is incidentally mentioned that the author had no seeds of *Rafflesia* at his disposition. Thus we have ample evidence that the entire drawing is nothing more than an imaginary horizontal section constructed from R. Brown's representation of a longitudinal section.

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* Linn. Transact., xix., 221, tab. 22, etc.

† Brongniart, Obs. sur les genres *Cytinus* et *Nepenthes*, Ann. Sc. Nat.

‡ Planchon, Des vrais et faux arilles. Montpellier, 1844, p. 19—22, t. 1.

§ Link, Jahresbericht für 1844. Compare also Botanische Zeitung, 1857, p. 700.

Coming to the seeds of the *Apodantheæ*, we possess, if we disregard a figure of the outward shape of a seed of *Pilostyles Thurberi*, A. Gray, as given by Torrey,[‡] nothing beyond the data furnished by Karsten[§] on the structure of his *Sarna Ingæ*. According to his representation, this plant has a homogeneous exalbuminous embryo, consisting of rather small-celled tissue, and enclosed in a woody testa composed of several layers of cells.

Now, my own investigations embrace a considerable number of types, kindly placed at my service by various friends. They are as follows:—*Rafflesia Arnoldi*, R. Br. (for the purposes of comparative examination of the ovules the closely allied *Brugmansia Zippelii* was brought into requisition); *Apodanthes Caseariæ*, Poit.; *Pilostyles Thurberi*, A. Gray; *P. Haussknechtii*, Boiss; *P. Ingæ*, Karst. (sub *Sarna*); *Cytinus Hypocistis*, L.; *Hydnora africana*, Thbg. (in the investigation of the ovules those of *H. Johannis*, Becc., were also partially used); and *Prosopanche Burmeisteri*, De Bary.

Rafflesia Arnoldi has, as we know through R. Brown, an immense fleshy fruit, filled with numerous small seeds. The ovules from which these seeds develop are likewise described in detail by the same author. I found exactly the same structure in the ovules of *Brugmansia Zippelii;* but those of *Rafflesia*, in a suitable stage of development, were not within my reach. I have since been able to determine the structure of the ovules of *Rafflesia Patma*, which deviates in no respect from the above-named species. A long, slender funicle bears the atropous nucleus, which is provided with a thick integument. Already at the time when this integument first begins to grow and envelop the nucleus, a rapid and strongly one-sided development of the tissue constituting or immediately at the base of the chalaza commences, eventually forming a knob-shaped swelling of this part, which in the course of its growth gradually reverses the position of the nucleus and its integument, its axis at length forming a more or less obtuse angle with the funicle (compare fig. 2 and 3). In many instances this unilateral growth is so decided that at first sight one might readily mistake them for anatropous ovules. Through the kindness of Mr. Carruthers, the present director of the Botanical Department at the British Museum, I have had an opportunity of examining ripe seeds from the original fruits that furnished Brown with the materials for his paper. The seed is attached to the cell-wall by means of the soft, fleshy funicle, from which it is easily detached at the point where the denser tissue of the chalazal swelling begins. For an idea of the form this protuberance assumes we may refer to the beautiful plates accompanying Brown's paper quoted above, and to fig. 1 of our plate. The outer coating of the seed, as well as the whole of the chalazal swelling, consists of dark reddish brown cells, provided with a firm woody membrane, whose outer walls are relatively thin, but the contiguous walls are uniformly thickened. The side walls of the wedge-shaped outer layer of cells are covered all over with dots or pits. At the micropyle end of the seed there is an interruption of the hard testa, the aperture being closed by a tissue of square, thin-walled, very small cells, each of which contains a drop-like mass of a dark brown colour. (Fig. 1 a.)

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[*] Treviranus, Ueber das Embryo von *Orobanche Lathræa* und *Cytinus*, Bot. Zeitung, 1857, p. 700.

[†] Weddell, in Annales Sc. Nat., série 3, xiv., 171.

[‡] Torrey, United States and Mexican Boundary Survey, under the orders of Lieut.-Col. W. A. Emory, vol. ii., 1859, Botany, p. 207, tab. lvii., fig. 1—5.

[§] Karsten, Ueber die Stellung einiger Familien parasitischer Pflanzen im system. N. Acta Leop. Carol., tom. 26 pars ii., tab. 5, fig. 7.

This testa encloses the inner hollow space, which, in comparison to the size of the entire seed, is relatively small. This space is immediately bounded by an outer brown, opaque, densely-woody, though thin, skin, the lateral limits of whose cells are, however, distinctly visible. Within this—close upon the compact, granulous, colourless wall of the embryo-sac—lies the inner coating of the seeds, the tissue of which appears at first sight to be composed of large homogeneous, thin-walled cells, copiously charged with a brownish oleaginous substance. A perfect idea of its real structure can only be ascertained from a central longitudinal section, as shown at fig. 4. It will be seen from a study of this figure that it consists of two parts—an inner cylindrical body, the embryo, which at the micropyle end abuts on the embryo-sac wall, and an outer enveloping endosperm, which at the opposite end from the micropyle is continuous. Both are so intimately grown together that, although occasionally one may succeed in detaching single endosperm cells without injuring the embryo, it is quite impossible to lay the latter free. The boundary-line between the two parts is all the more readily distinguishable because the membrane here slightly exceeds in thickness that of neighbouring walls. The endosperm layer is nowhere more than one cell in depth. The embryo, as an examination of an horizontal section shows, is formed of four continuous rows of cells. Each row consists of several—usually six cells. Their number is pretty uniformly the same in the four rows of one and the same embryo, and as the partition walls of the cells of all the rows in a cross section fall in the same plane, it follows that we have a kind of storied structure of the whole embryo, consisting of about six stories, one above the other, each story of four apartments. But it not unfrequently happens that this symmetry is broken by the appearance of an extra partition of one or more of the cells. Other very common irregularities occur from slight distortions of the cells of the embryo (see fig. 4), as must naturally happen, where in two successive stories the longitudinal cell-walls separating the rows of cells do not fall in exactly the same vertical planes. The lowermost story, or stratum of cells next the micropyle end, is in all cases different from those overlying it, in consequence of the cells being narrower; but the degree of difference is variable. Moreover, it could not be ascertained whether this layer consists of four cells, as in the others, or whether it remains 2-celled. This must be considered in the light of embryo-bearer, or connecting channel. Again, we must not omit mentioning that the data upon which the explanations here given of the separate parts of the seed rest, could only be verified by, or based upon, due investigation of allied forms. For, from the close union of all the cells, their universally equal size and similarity of contents, we might, reasoning from cause to effect, just as readily have taken the whole mass contained within the seed as an exalbuminous embryo, with an early and marked separation of the dermatogen.

In *Pilostyles** the seeds (fig. 7) are sessile on the smooth inner surface of the fruit. They are also provided with a very hard and a more or less deeply brown coloured testa, with, however, an outer covering consisting of a thin layer of tender-walled juicy cells. The ovules from which they originate are perfectly anatropous, and furnished with two coats (fig. 8), of which, however, the outer is very variable in the degree of development it exhibits. Sometimes, for example, it almost covers the ovule; in other cases the whole of the front half, or even more, is left exposed, whilst in extreme instances it is reduced to an imperfect collar encircling the chalaza. Such ovules as those last mentioned, which occur abundantly in the same fruit with others, serve well to support a view that seeks to destroy the marked difference between the atropous ovules of *Rafflesia* and the anatropous ones of *Pilostyles*, inasmuch as the rudimentary outer coat in the latter genus would be looked upon as of the same nature as the chalazal swelling in *Rafflesia*. It is evident that in the ripe seed the outer juicy envelope is formed from the outer coat, whilst the origin of the hard testa may be traced back to the inner. At the spot answering to the micropyle its continuity is interrupted, the gap being filled up with an empty small-celled tissue, whose rough, finely-granulated membrane is so twisted and folded hither and thither as to render it almost impossible to discern the boundary of the cells.

Now this testa is composed of a single or, in places only, of a double layer of cells, which soon become very intimately united, and whose brown membrane is pierced with numerous pore-channels. The breadth, shape, and frequency of the latter, and the relative thickness of the cell-walls and diameter of the cell-cavity varies in all the species examined; so that the species might be determined from the smallest fragment of the seed-skin. The thickest and most homogeneous partitions—and hence the greatest density—is found in the dark reddish-brown testa of *P. Ingæ*, and the thinnest cell-walls and the largest cavities are peculiar to the straw-coloured testa of *P. Thurberi*.

The contents of the hard, granular embryo-sac membrane consist as in *Rafflesia* of the embryo alone, surrounded by the endosperm of one layer of cells. Although an exact investigation of the structure of *Pilostyles* is rendered somewhat difficult from the extraordinary size of the very thin-walled cells filled with turbid oily matter, still a vertical section always shows much more distinctly the boundary between embryo and endosperm than is ever seen in *Rafflesia*. In a cross section it is less plainly visible, and therefore we can the more readily understand why Karsten, who figures only a cross section, overlooked it, and took the whole for a homogeneous embryo. In consequence of the cell-walls of the endosperm, which are directed inward, and the cell-walls of the embryo directed outwards and abutting against the former, presenting strongly convex surfaces to each other, there are intercellular spaces where these cells do not touch. They are, in a longitudinal section, of an irregular three-cornered outline, and contain globules and masses of the same nature as the endosperm and embryo. (See fig. 6.) From the presence of this matter it is often hard to tell whether we have really intercellular spaces into which it has flowed from the force of the cut, or whether these spaces answer to true cells, and owe their malformation to the growth of the embryo.

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* I am indebted to the kindness of Dr. Asa Gray for ripe fruit of *P. Thurberi*, A. Gray; and from Prof. Haussknecht, I had fruit of *P. Haussknechtii*, Boiss. Furthermore, I received original fruit-bearing specimens of *Sarna Ingæ*, Karst., amongst the materials sent to me, with their usual liberality, from the Imperial Museum at Vienna.

The latter is decidedly club-shaped, with its smaller end turned towards the micropyle, and protruding through the endosperm to the embryo-sac wall. At this end it is everywhere equally grown to the cells of the endosperm, whilst on the opposite end we have the intervening three-cornered spaces already described. It is built up of about five layers or stories of cells in one series. The two lower are usually limited to one cylindrical cell each, of unequal length; and the other three stages consist of pairs of cells. The upper one, indeed, is often 4-celled, the cells being arranged in the form of a quadrangle. Whilst it is difficult to draw any conclusion from the mature embryo of *Rafflesia* respecting its mode of development, it can here be proved with the greatest certainty that all the horizontal partitions must be of the same age as the perpendicular walls of the cells of the different stories dissected, for the cells of the different stages do not stand immediately above each other, nor do they cross at right angles, but they cut each other at all conceivable angles; each embryo exhibiting a different disposition of the pairs of cells of its several stories. As a consequence, the difficulty of obtaining a thorough understanding in this respect is considerably enhanced, it being impossible to isolate the embryo, hence our means of information are limited to sections; in addition to which we have to encounter the enormously large cells of the embryo with strongly convex outer walls, two circumstances unfavourable to the examination of the perfect embryo except in thick opaque slices.

A sure clue to the origin of this peculiar seed structure, and especially to the mode in which the intercellular spaces previously mentioned as occurring between the embryo and endosperm are formed, was afforded by an examination of the seeds of *P. Haussknechtii*, in the seeds of which the convexity of the abutting cells of the embryo and endosperm is much less prominent, and thus the cellular nature of these said intercellular spaces is more clearly seen than in the other species. The section fig. 9 was particularly instructive.

In the seed from which this preparation was taken, from some cause or other, although fully developed, the embryo had not attained its normal size, and the convexity of its outer cell-walls is almost wanting, whilst the endosperm consists of two distinct layers, of which the inner, in regard to size of cells, far exceeds the outer.* The boundary cell walls of the two parts are perfectly flat. According to this then, comparing it with the normally developed seed, it is perfectly clear that the originally homogeneous endosperm which at first filled the whole cavity of the embryo-sac is subsequently crowded up by the gradual expansion of the outer layer of its own cells and the development of the embryo, and thereby some of the cells become obliterated and disappear. The crippled remains of this inner portion represented by the three-cornered spaces which we found between the permanent outer layer of the endosperm and the embryo, are no longer to be mistaken.

The seeds of *Apodanthes Caseariæ*, Poit., are closely related in structure to those of the allied genus *Pilostyles*.† The embryo is here as in the former surrounded by a layer of endosperm cells. The compression of the inner cells of the endosperm, that is to say if such ever existed, was so complete that no trace of them was left, at least in the seeds examined by me, and the endospermal layer and embryo were closely joined leaving no intervening spaces. The two stages of cells of the embryo next the micropyle are filiform and narrow, and closely embraced by the extremely enlarged surrounding endosperm cells.‡ From this cause they in all probability are really the cells of an embryo-cord, and as such we may perhaps be justified in considering the similar cells of the embryo of *Pilostyles*. In *Apodanthes*, too, the testa is formed of two layers, an outer consisting of thin-walled fragile almost empty cells—not juicy as in *Pilostyles*—and an inner composed of excessively dense, thick, brownish-red cells. The cell-membrane of the inner layer, soon completely consolidated between the cells, is not as in *Pilostyles* equally thickened on all sides, but the thickening is confined chiefly to their side and inner walls, which are likewise perforated with a number of slender branched radiating pore-channels, with a round cross section. The outer wall remains thin, and the cavity is now always full of an opaque, homogeneous, dark reddish-brown substance.

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* Seeds of this nature have otherwise not come under my observation; but from a number of drawings which I had the opportunity, through Strasburger's kindness, of looking over, it appears that he found several of the same sort. Perhaps it was because the fruit of his specimen was a trifle younger than mine.

† Through the kindness of Professors Eichler and Warming, I received ripe fruit of this plant collected in the vicinity of Rio Janeiro by Glaziou. I have had besides the opportunity of examining some seeds from Poiteau's original specimens.

‡ Something quite similar occurs in the seeds of *Monotropa Hypopitys*. Just as in *Apodanthes*, we have here, what in the young stage was clearly an embryo-cord, reduced to a thin thread by the expansion and pressure of the growing endosperm cells, to such a degree sometimes that in the ripe seed it is scarcely distinguishable. The originally spherical embryo also suffers compression, and eventually assumes an irregular angular form. In passing, I may mention that the embryo, in the seeds examined by me, at all events, consist of at least five cells, and not as Hofmeister states (Die Entstehung des Embryo, p. 36), of only two. The five cells are arranged in three layers in such a manner that the lower (the Hypophysis?) is 1-celled, and the two others each 2-celled. In unrolling the contents of the seed which have been rendered transparent, there is only one position in which all the cells are visible. If turned ¼ farther the embryo appears to consist of three cells one above the other, or even of only two, as the exceedingly small lower cell is often no longer to be seen. See the figures 10 and 11.

The small atropous ovule of *Cytinus Hypocistis* is furnished with a single integument, and at the base of the funicle there is a number of irregular scale-like appendages, which may perhaps be compared to the chalazal swelling in *Rafflesia* and the outer coating of *Apodanthes*. Hofmeister was the first to thoroughly investigate its structure and development. It matures into a small oval seed,* having a hard, brittle, straw-coloured testa, consisting of polygonal flattened cells, strongly thickened all around, and furnished with numerous pore-channels.

Both at the chalazal and micropyle ends there are breaks in the testa, where we find clusters of small-celled, thin-walled, nearly empty tissue. If the hard seed be carefully burst, open the endospermal body, enclosed within the hard granular embryo-sac and connected with the two stoppers of soft tissue, just described, may, by the aid of a needle, be pretty easily extracted (fig. 12). It is an egg-shaped, colourless body, built up of exceedingly thin-walled cells, which at first appears to be formed of quite homogeneous tissue. And it was only after working at it for a long time that I succeeded in finding the embryo, the structure of which was then ascertained by means of vertical and horizontal sections. The embryo of *Cytinus* resembles that of *Rafflesia*, and consists of large extremely irregularly formed cells closed all over and grown to the endosperm, the cells being arranged similarly to those of *Pilostyles* in four or five stages. But whilst in the latter the stages lying next to the embryo-sac wall consist of solitary cells, they appear here to be divided by at least one longitudinal partition. Sometimes, it is true, one or the other appears to be quite undivided, but by rolling back the endospermal portion the partition wall comes into view. The entire embryo is of an irregular oval form. The first layer or stage contiguous to the embryo-sac wall consists of much smaller cells than the others, and may represent the embryo-cord. The second and third stages are usually the largest; and the latter frequently presents a cross division into four parts, the cells of which are easiest seen when in manipulation the outer face of a square cell is turned upwards so that the line of union of both vertical partitions is visible on both sides, and this layer appears to part into one large, one medium, and two smaller cells. Fig. 12 best illustrates what we have just described.

So far, all the forms we have had under consideration present a close relationship in regard to the structure of their seeds; but when we come to treat of the Brownian group of *Hydnoraceæ*, we cannot say the same holds good. I was able, through the courtesy of the discoverer, to examine fully-developed, though still unfertilised, ovules of *Hydnora Johannis*. They were cylindrical, sessile, crowded bodies (fig. 15) on the pendulous placentas of the ovary. After having alternately treated the preparation with potash solution and Schultz's fluid, and partially destroyed the opaque corpuscules deposited in the cells, we are able to discern that the ovules, in conformity with R. Brown's description, are atropous, and exhibit a broad parenchymatous papillose base, from which the relatively small nucleus, with its single, several-layered enclosing integument rises. The integument appears to be perfectly closed over the apex of the nucleus, but a very close examination of it will reveal the extremely slender channel of the micropyle, which is all the more difficult to find on account of the unequal distension of the contiguous cells.

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* I received ripe seeds of this plant some time ago from Montpellier through my friend Prof. Planchon.

From a microscopical preparation, taken from a specimen of *Hydnora africana*, in the collections of the Botanical Institute at Halle, and kindly communicated by Prof. de Bary, I had an opportunity of examining the ovules in a younger stage of development, in which the nucleus of the ovule still projected beyond the integument in course of formation. The former was recognisable as an axile circle of cells enclosed within a surrounding collar or mantle, the anterior cell beginning to enlarge as the embryo-sac, whilst those placed at the back were already more or less divided by longitudinal partitions. A vertical section of the fully-formed ovule of *Hydnora Johannis*, Becc., offers exactly the same structure, the enveloping layer of cells enclosing two axile series of cells rising above the still incompletely formed embryo-sac.

De Bary* has fully described the ovule of *Prosopanche Burmeisteri*, but at that time the fruit was only known from Mr. Schickendantz, the discoverer's, description. Amongst the more ample materials recently come into the possession of De Bary there are several sections of the almost ripe fruit of this plant, and through his generosity the much desired opportunity of examining the structure of the seed was gained. A complete section of the fruit exhibits essentially the same structural characters as that of the ovary at the flowering time. The crowded, closely-appressed surfaces of the placental plates are characterised by their seeds being intermingled, the central line of each placental plate presenting itself as a lighter-coloured homogeneous, seedless tissue. The wall of the seeds-vessel has become a thick, solid, dark-brown shell. In consequence of the unequally projecting remains of the tissue of the placental plates the detached seeds have assumed an irregular shape. The testa is composed of one layer of peculiarly thickened cells, and that again enveloped in the thin, almost empty, tissue already alluded to, which also fills up the only break in the continuity of the embryo-sac at the chalazal end. (See fig. 17.) The cells of the testa, which unite at an early stage, have a thin, fragile outer wall; whilst the inner, and in a less degree the lateral, exhibit a very peculiar concretion. This is due to the unequal deposit of the thickening matter, in consequence of which irregular air-tight cavities of a polygonal section are formed, bearing plates of lattice-like tissue of a spongy nature, answering to the inner layer of the membrane under consideration. Thin cross sections of it (fig. 16) have an unevenly reticulated appearance. With a powerful lens the surface openings of the slender tubes, arising from the non-thickening of the membrane, may be detected.

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* De Bary, *Prosopanche Burmeisteri*, Abhandlungen der Naturforscher Gesellschaft zu Halle, vol. x., p. 249, t. 62, figs. 14 and 15.

This peculiarly-formed testa encloses the dense, horny, albuminous body of the seed, which conceals the proportionately small embryo at a point close to the micropyle end. The albumen consists of two essentially distinct portions, in so far as their cellular structure is concerned; but these are nevertheless closely united in all parts. The outer envelopes the other like the cover of a ball, and is remarkable for its great inequality of thickness. Thus, at the micropyle end it is very narrow and only one layer thick; but gradually increasing it attains a considerable thickness at the chalazal end. (Fig. 17.) Its cells are so much thickened that the cavity is almost obliterated; and the glass-like, homogeneous, transparent cell-walls are thickly studded with large pores. Unless treated with K.O. it is impossible to discern the cell boundaries (fig. 13), and its inner limit, next the central portion of the albumen, was first clearly defined by the same means.

In this central albumen the cell-walls are almost, if not quite, undistinguishable. The rather large oval, irregularly-scattered cavities appear to be embedded in a homogeneous glass-like substance (fig. 13). They contain a dense, turbid, finely granular substance, which is readily poured out where they are opened in cutting the section; and which, when observed in almond or citron oil exhibits a great tendency to a kernel-like condensation. The embryo lies free in a cavity of the inner albumen, and is fastened to the surrounding tissue by means of a connecting cord. This cord is short and cylindrical, and consists of a few (three or four) compressed, plate-like cells, and does not extend beyond the junction of the central and outer albumen. Hence it is evident that this boundary surface, to which it was originally attached, answers to the walls of the embryo-sac, and that also the outer shell of albumen is developed from the tissue lying without the nucleus, and therefore we have an endosperm sheltering the embryo, and a highly developed perisperm enclosing the whole. (See fig. 13.)

The embryo lies quite free in a cavity of similar shape to itself, and is loosely attached to the cord. Around this cavity we usually find a number of distorted, nearly empty, cells. The embryo was not found in the same stage of development in all the seeds examined, which may be attributed to the fact that the fruit, although nearly ripe, was not quite perfect. In most instances it consisted of four contiguous rows of cells, in which the position of the horizontal cell-walls was such as to bring the cells into four or five stories. (Fig. 13.) Occasionally, and especially in the younger embryos, there were fewer (only three) stories, but these were deeper. (Fig. 20.) Finally, in some few cases, the four anterior stages were divided by tangential partitions into enclosed and surface cells; in the lowermost (the hypophysis?) these partitions were wanting. All parts of its membrane are of extreme tenuity, and in consequence much crumpled and folded; and the cell contents turbid and much shrunk, and from the action of the alcohol considerably withdrawn from the outer walls. And these conditions seem to indicate that it had not attained its full development.

In its main features the structure of the seed of *Hydnora africana* is essentially the same as that of *Prosopanche*, as I have been able to verify, partially from dried seeds and partially from those preserved in spirits, in the collection at the British Museum, obligingly placed at my service by Mr. Carruthers. (See figures 14, 18, 19.) The uneven testa, evidently originating in the fleshy integument, is composed of fragile, thin-walled, nearly empty, dark brown tissue, the cells of which bordering the albumen exhibit a thick, homogeneous, poreless, inner wall. (Fig. 19.) It is therefore similar in construction to the seed-skin of *Prosopanche*. As in the latter, there is a double albuminous body, although here, in consequence of the outer portion being uniformly one cell deep all round, it is less conspicuous. (Fig. 18.) The cavity containing the embryo is situated, as already stated by R. Brown, almost in the centre of the seed; and here also the embryo-cord is throughout its entire length intimately united with the surrounding endospermal tissue. (Fig. 19.) The cell cavities of the latter are somewhat club-shaped, and irregularly radiating, taking the ovule as the axis, and they gradually decrease in size towards the centre.

The embryo-cord of *Hydnora* consists of a single row of unequal quadrate or flattened cells, some of which are usually divided lengthwise, giving rise to various irregularities in its shape. At the point it gradually extends itself, and from the production of a large number of these partitions it assumes the structure of a cellular body, frequently pushing itself in at the side of the embryo as a shapeless mass of tissue. (Fig. 14.) In *Hydnora*, too, the connection between the embryo and embryo-cord is extremely delicate, insomuch that in cutting the seed through, the former generally drops out, an inconvenience that may be avoided by cutting as near as possible to the embryo cavity without opening it, and moistening it with potash solution, to retain the embryo in its position, before proceeding further with the dissection. The embryo consists of a closed tissue of numerous cells filled with a turbid substance, the early divisions of whose cell-structure cannot be made out with any degree of certainty. Nevertheless, in general it seemed that its tissue did not proceed from a direct further division of octagons, but rather from that of the different overlying similar stories of cells, in which it would well agree with the structure of the closely-allied *Prosopanche*, assuming that the latter belonged to an earlier stage of development, and has remained stationary.

It has already been mentioned that the similarity of the embryo and its development in *Cytinus*, the *Apodanthæ* and *Rafflesiæ*, connects these plants; and through these investigations their close relationship, first established by R. Brown, and now generally admitted, has received a fresh confirmation. On the other hand, so far as the *Hydnoraceæ* are concerned, which most botanists, following Brown, refer to the same group, even if the development of the embryo be the same (which is indeed possible, though from available data not provable), the presence of albumen especially, taken with other already known important differences, seems to indicate a more distinct line of separation. But what the degree of relationship may be that connects the *Rafflesiaceæ* and *Hydnoraceæ* to one another, and to the neighbouring families, further researches, I trust, will unravel, for, so far, I have not arrived at any answer to the question.

Description of Tab. 151, 152.*

Fig. 1. A longitudinal section of the seed of *Rafflesia Arnoldi*, the contents of which have fallen out. At *a* the mass of tissue closing the micropyle. Magnified about 120 diameters. 2 and 3. Ovules of *Brugmansia Zippeliana*, Bl. 4. Seed-contents of *Rafflesia Arnoldi*, Br., cut lengthwise, showing the enclosing endosperm of one layer of cells. Magn. 160 diams. 5. A cross section of the same. One of the 4 cells of the embryonal layer cut through, divided into two by a supernumerary partition. Magn. 160 diam. 6. A longitudinal section of the interior of the seed of *Pilostyles Ingæ*, Karst (sub *Sarna*). Between the embryo and the single endospermal layer are the remains of partially obliterated cells, answering to the three-cornered spaces. Magn. 400 diams. 7. A ripe seed of *Pilostyles Thurberi*, Torr. 8. An ovule of *Pilostyles caulotreti*, Karst. (sub *Sarna*). Magn. 160 times. 9. A longitudinal section of the contents of an immature seed of *Pilostyles Haussknechtii*, Boiss. The perfectly normal embryo has ceased to extend itself, and in consequence the inner cells of the endosperm are still unbroken and not reduced to three-cornered rudiments as in fig. 6. Magn. 400 diams. 10 and 11. The interior of the seed of *Monotropa Hypopitys*, L., from different points of view, the embryo visible in both positions. Magn. 400 diams. 12. Seed-contents of *Cytinus Hypocistis*, L. All the stories of the embryo two-celled; endosperm consisting of one layer of cells. 13. A portion of a vertical section of the contents of the seed of *Prosopanche Burmeisteri*, De Bary, *p.* perisperm (outer albumen), *e.* endosperm; embryo consisting of four rows of cells in four stories. Magn. 400 diams. 14. A portion of a longitudinal section of the seed-contents of *Hydnora africana*, Thbg., *p.* perisperm, *e.* endosperm. The embryo-cord penetrating the ovular cavity as a shapeless mass. Magn. 400. diams. 15. Atropous (orthotropous) ovule from an unexpanded flower of *Hydnora Johannis*, Becc. Slightly magnified. 16. A small fragment of a section of the testa of *Prosopanche Burmeisteri*, De Bary, showing the spongy thickening of the cell-walls. Magn. 400 diam. 17. A slightly enlarged cross-cut of the seed of *Prosopanche Burmeisteri*, De Bary. 18. A cross section of the seed of *Hydnora africana*, Thbg. Not exactly central, and therefore not exposing embryo-cord. Slightly magnified. 19. A portion of a longitudinal section of the seed of *Hydnora africana*, Thbg., showing the structure of the testa, both layers of albumen and the embryo-cord. Magn. 160 diams. 20 and 21. Embryos of *Prosopanche Burmeisteri*, De Bary. The tip of that represented in fig. 21 unfortunately destroyed. Magn. 400 diams.

[Translated from the *Botanische Zeitung*, for May and June, 1874.]

ON THE GERMINATION OF THE SEEDS OF *UTRICULARIA VULGARIS*.

By E. Warming.

The seed has almost the form of a 4-6 sided prism, but the micropylar face is rather smaller than the opposite one. There is no albumen, but the cells of the embryo, which are nearly isodiametrical, are full of starch and spherical granules resembling aleurone. The uniform parenchymatous cells of the embryo are somewhat smaller in the region of the plumule. The epidermis forms the only well-marked layer of cells. There is no root, nor does one become developed at any stage. The epidermal cells are arranged in radiating series in the radicular part. The leaves are also wanting, at least in most cases, but I do not know whether the embryo whilst still in the seed can develope itself beyond the stage represented [in one of the figures accompanying the paper.] The summit of the axis exhibits a valley-like depression; during germination there are developed here—(1st) from six to twelve "primary" leaves, (2nd) an utricle (or two), and (3rd) the summit of the conical axis which will give origin to the stem with its alternate leaves. Immediately after their first appearance the "primary" leaves have the form of blunt prominences; afterwards they become conical and nearly at the same period the radicular extremity, being then lighter than the plumule, turns itself upwards, and the seed is raised from the bottom to the surface of the water. The leaves then burst through the testa and the young plant takes after a little while a horizontal position. The developed primary leaves are subulate, the upper ones being sometimes more or less laciniate. They present a remarkable peculiarity in their angles of divergence not being constant. Many appear simultaneously without any order. It is impossible to determine which leaf should be regarded as a cotyledon.

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* We are indebted to the Editors and Publisher of the "Botan. Zeitung" for permission to copy the figures which accompany Count Solms' memoir. From the exigencies of space we have been compelled to reduce by one half figs. 2, 3, 6, 7, 8, 9, 10, 11, 15, 20, and 21.—[*Ed. Journ. Bot.*]

On the elongated stem the leaves are alternate (½), but they may approach in pairs and become nearly opposite; they at once fork, and the angle is occupied by an utricle, but this is sometimes absent, when we find nearly always in its place a subulate tooth. The two lateral divisions at once split into two by a pseudo-dichotomy, and the leaf has in consequence four principal and apparently equal lobes.

At the base of the stem we find a tendril ("ranke" of Pringsheim) which arises from the side of the principal axis. I have also sometimes met with one or two extra-axillary branches.

Immediately after the primary leaves there is always formed an utricle (rarely 2) which is very often of larger size than the subsequent ones, and clearly forms a floating apparatus of great importance in supporting the young plant. Its position differs from that of all the subsequently formed utricles, in not being on a leaf but directly on the principal stem. From its position with reference to the leaves, preceding and following it, I had hoped to get some light as to its morphological value; but in consequence of the varying angles of divergence of the primary leaves, it is very difficult to see whether it forms a part of their spiral; usually it diverges at a marked angle from the uppermost leaf. It is the same with it as regards the alternate stem-leaves; I have, however, found nothing in its situation which prevents me from considering it as a leaf.

The fact mentioned above, that the stem-leaves often carry in place of the utricle a tooth or subulate lobe in the centre of the fork, also favours the hypothesis of the utricle being a leaf, or a part of a transformed one, but gives no decisive evidence on the point. The analogy of *Genlisea* also seems confirmatory, but it does not seem to be possible at present to adduce decisive proofs, or to indicate the homologies of the different parts of the utricle.—[From the French abstract of a paper in the Copenhagen "Videnskab. Meddel. f.d. Naturhist," Foren, 1874, n. 3—7.]

Botanical News.

Articles in Journals.—August.

American Naturalist.—F. Brendel, "Notes on the Flora of S. Florida."—D. S. Jordan, "Key to higher Algæ of Atlantic coast between Newfoundland and Florida."

Oesterr. Bot. Zeitschr.—Wiesner, "On the Demonstration of Cellulose in Cork Tissue."—A. Kerner, "*Orobanche micrantha*, n.s., *O. ionantha*, n.s."—R. v. Uechtritz, "Botanical Notes" (*Epilobium Krausei*, n.s. = *alsinifolium* × *palustre ?*)—J. C. Schlosser, "The Kalniker Gebirge" (contd.)

Hedwigia.—P. Magnus, "On *Protomyces pachydermus*, Thum."—J. Juratzka, "Two New Mosses" (*Barbula commutata*, *Rhyncostegium mediterraneum*.)

Bot. Zeitung.—F. Hegelmaier, "On certain Lycopodiaceæ" (contd.)—W. Pfeffer, "Hesperidin, a constituent of some Aurantiaceæ."—T. Irmisch, "On the Morphology of some species of *Geranium*, especially *G. sanguineum* and *G. tuberosum*" (tab. 9).

Nuovo Giorn. Bot. Ital. (27 July).—J. Tchistiakoff, "Comparative Researches on the Development of the Spores of *Equisetum limosum* and *Lycopodium alpinum*" (tab. vii.—xii.)

Flora.—A. Minks, "*Thamnolia vermicularis*, a monograph" (tab. 5).—J. Müller, "Lichenogical contributions" (contd., 4 new species).—H. Wawra, "On the Flora of Hawai."—E. Fleischer, "On the Embryology of Monocotyledons and Dicotyledons" (tabs. 6—8).—F. Arnold, "Lichenological Fragments (*Bruchia vogesiaca*)."

New Book.—The Forest Flora of North-West and Central India; a handbook of the indigenous trees and shrubs of those countries, commenced by the late Dr. Stewart, and continued and completed by Dr. Brandis. With an Atlas of Plates by W. Fitch. £2 10s.

The last part (tom. xiv., part 1) of the *Bulletin de la Société Royale de Botanique de Belgique* contains an important contribution to cryptogamic botany in the shape of a Monograph of European *Jungermannideæ*, illustrated with analytical figures of most of the genera. We hope to notice this monograph more fully at an early opportunity.

In the Copenhagen "Vidensk. Meddel. f.d. Naturhist. Foreming" for 1874, no. 1-2, Warming continues his "Symbolæ ad Floram Brasiliæ cognoscendam," with the Lentibulariaceæ, Primulaceæ, and Myrsinaceæ. Four new species of *Utricularia*, one of *Genlisea*, and one of *Myrsine* are described; and there are two plates illustrative of the first genus. A paper on the structure of *Genlisea* is also contained in the same journal (no. 3-7), illustrated by two plates, as well as the interesting account of the germination of *Utricularia*, an abstract of which is given at page 314.

Original Articles.

ON THE BOTANY OF THE MALTESE ISLANDS IN 1874.

By J. F. Duthie.

A severe winter, followed by a cold, wet spring, greatly kept back the vegetation of these islands, as well as of other parts of the Mediterranean; and the temperature even to the end of April must have been far below the average. The unusual amount of moisture, however, helped in many cases to favour the luxuriant growth of several species of plants, and may perhaps explain the fact of my having found in such abundance this year in the island of Gozo *Senecio pygmæus*, a plant never recorded before for these islands. It was most plentiful near the sea in shady places, where it sometimes attained a great size (for it), some of the plants measuring from 8 to 10 inches; whereas the examples from southern Sicily, where formerly it was supposed to be restricted, were described by Gussone as from 2 to 3 inches only in height; but the locality, I am told, is a very dry one.

The places in Malta where I botanised chiefly this year were the Corradino Hill, Wied Kerda, Wied el Zasel, Wied el Zorrik (also called Wied Babu), and the neighbourhood of Melleha. I will give a short description of each of these localities, mentioning some of the more interesting plants which may be met with.

The *Corradino* is a large piece of rocky ground situated to the S.E. of the Grand Harbour. A considerable portion of it towards the centre is occupied by the military prison. It is a capital place for collecting good specimens of many of the commoner Maltese plants, though not devoid of rarities. I have gathered most of the following:—

Adonis Cupaniana and *citrina*, *Ranunculus flabellatus*, *Brassica incana* and *B. fruticulosa*, *Viola parvula*, *Alsine tenuifolia*, var. *viscidula*, *Sagina melitensis*, Gulia! (sp. ined.), *Hypericum crispum*, *Lotus creticus*, *Trifolium stellatum*, *T. resupinatum* and others, *Trigonella monspeliaca*, *Vicia leucantha*, *Sedum cæruleum*, *Galium saccharatum* and *G. murale*, *Fedia Cornucopia*, *Hyoseris scabra*, *Hedypnois tubæformis*, *Convolvulus althæoides*, *C. pentapetaloides*, and *C. lineatus*. *Cerinthe aspera*, *Euphorbia peploides*, *Orchis saccata* and *O. fragrans*, *Iris ægyptiaca* (said to grow here), *Narcissus Tazzetta* and *N. Cupaniana*, *Brachypodium Plukenetii* and *B. distachyon*.

Wied Kerda is a long straggling valley extending from near the village of Zebbug to the "Marsa," which is a large piece of marhsy ground towards the upper end of the Grand Harbour. On the rocks on either side of this valley there is plenty of *Orsinia camphorata*, *Rhamnus oleoides*, *Erica peduncularis*. Dr. Gulia told me of the occurrence, too, of *Erica sicula* (in one spot), *Coronilla stipularis*, *Micromeria microphylla*, *Andropogon hirtum* and *A. distachyon*, *Lycopodium denticulatum*.

Below the rocks on the grassy banks—*Orchis lactea* (*O. Tenoreana*, Guss.), *Romulea ramiflora*, *Anthoxanthum gracile*, &c., may be gathered. Higher up the stream is a large quantity of *Calendula sicula*, which, till lately, was its only locality in Malta, though Dr. Gulia found some plants of it this year in the N.W. part of the island. In Gozo it is more frequent.

In *Wied el Zasel*, near the village of Musta (known by many of the English people as the "Rocky Valley"), are to be found:—

Clematis cirrhosa, *Ranunculus muricatus*, *Polygala monspeliaca*, *Malva micæensis*, *Ruta bracteosa*, *Astragalus hamosus* and *A. sesameus*, *Trigonella monspeliaca*, *Vicia cuneata* and *V. leucantha*, *Lathyrus tenuifolius*, *Putoria calabrica*, *Centranthus Calcitrapa*, *Erica peduncularis*, *Conyza Tenorii*, *Echium calycinum*, *Phlomis fruticosa*, *Periploca angustifolia*, *Euphorbia dendroides* and *E. pubescens*, &c.

Some little distance above the valley, at its northern extremity, there is a large extent of uneven rocky surface, the depressions of which at this season of the year (early spring) are well filled with water, and contain generally a luxuriant growth of aquatic plants. These little rocky basins occur plentifully in different parts of the island, and the nature of their vegetation is more or less identical, consisting of such plants as the following:—

Ranunculus aquatilis vars. *Baudotii* and *trichophyllus*, *Elatine macropoda* (Guss.), *Bulliarda Vaillantii*, *Callitriche truncata*, *Zannichellia palustris* and *Z. dentata*, *Chara* (2 sp.)

Wied el Zorrik, on the southern coast, near the village of Crendi, is a good example of one of those curious rocky ravines of which there are so many in these islands. It is extremely rich in rarities, and is perhaps the best collecting ground in the island. I have gathered some fine plants of *Anemone hortensis* growing under the shade of Carouba trees; several good orchids are to be found on some of the patches of turf, viz.: *Orchis undulatifolia*, *O. Tenoreana*, and *O. longicornu*; *Ophrys tenthredinifera*, *O. bombyliflora*, *O. fusca*, and *O. lunulata*. At the lower part of the valley the rocks on either side are thickly clothed with plants of *Euphorbia melitensis*, *Lotus creticus*, *Hypericum ægyptiacum*, *Coronilla glauca*, &c.; whilst here and there may be found *Lonicera implexa*, *Carex gynobasis*, *Anthoxanthum gracile*, *Sonchus tenerrimus*, *Daucus rupestris*, *Linaria reflexa*, *Melica minuta*, *Teucrium flavum*, *Sedum cœruleum* and *S. amplexicaule*, &c.

The best plant to be got here, however, is *Centaurea crassifolia*. This very remarkable-looking plant, not at all like a *Centaurea*, nor even a Composite, until one sees its flowers, is, as far as at present known, confined to these islands. It grows in the fissures of rocks at the seaward extremity of Wied el Zorrik, and in a few other places along the southern coast. Its leaves, which are very fleshy, become closely crowded towards the base of the stem, giving to the plant at a little distance the appearance of a species of *Sempervivum*. The flowers, which are purple or white, are borne on stems a foot or more in height. It flowers from May to August. I shall have something further to say about this plant when I come to speak more particularly on some of the more interesting plants of these islands.

Melleha is a small village in the north-western part of the island, lying within that portion of Malta which, together with a part of Gozo and the intervening islands of Comino and Cominetto, underwent at some time or other a subsidence so as to bring down the upper beds of coral limestone and marl to the sea-level. These upper deposits, from their capability of forming springs, support a more varied vegetation. There are several sandy bays towards the north, of which Melleha Bay is the largest. Nearly all the coast on the northern side has a shelving shore, whilst that to the south-west and south presents more or less a high precipitous wall; this applies for the most part to all these islands, the general dip of the rocks being in a north-easterly direction.

I put up at the small village inn for four days, and made excursions in different directions.

Down at the bay on sandy ground I gathered *Nigella damascena*, *Sinapis incana*, *Silene sericea*, *Malva cretica*, *Erodium chium*, *Ononis ramosissima*, *Hedysarum capitatum*, *Melilotus compacta*, *Medicago marina* and *M. arabica* (a form of *M. maculata*), *Polycarpon alsinifolium*, *Anthemis secundiramea*, *Hedypnois cretica*, *Convolvulus pentapetaloides*, *Sideritis romana*, *Euphorbia terracina*, *Emex spinosa*, &c.

In the neighbourhood of Selmun, to the north of Melleha, on marly ground by the sea, there was plenty of *Melilotus messanensis*, *Romulea Columnæ*, *Diplotaxis scaposa*, DC.? *Linaria reflexa*. On the rocks I gathered *Brachypodium distachyon*, and a beautiful *Lotus* like *L. creticus*, but with very fleshy leaves. On my return to Melleha I noticed *Calendula bicolor* growing in tolerable abundance by the roadside, and in one place several plants of *Linum angustifolium*.

On the following day I went to a place called Gneyna, a few miles to the south of Melleha. There is a very picturesque little valley here with a clear stream in it all through the year. It is a good place for many aquatic plants, including the common water-cress, which is tolerably plentiful here. Among other things I noticed—*Ranunculus muricatus*, *Sium stoloniferum*, *Juncus acutus*, *Zannichellia palustris*, *Scirpus globiferus* and *S. maritimus*, *Carex distans*, *Callitriche* sp., and *Chara* sp.; and by the side of the path *Anchusa italica*, *Malva nicæensis*, *Solanum moschatum*, *Melilotus infesta*, *Stellaria grandiflora* (var. of *S. media*), &c. *Fagonia cretica* is said to grow on walls and rocks near here.

The next day I was anxious to explore some ground to the west of Melleha, and to examine by the way a series of small valleys which descend in a north-westerly direction. On the high open ground above Melleha *Helianthemum ericoides*, var. *pubescens*, was beginning to open its yellow blossoms in company with *Anthyllis Hermanniæ* and *Euphorbia melitensis*, which form the principal vegetation in some of the barren stony fields about here. In a small field I noticed several plants of a very common-looking *Silene* growing amongst some corn. I was unable to determine the species until my return to England, when it proved to be *Silene Behen*, L.

As to the vegetation of the small valleys I spoke of, I was much struck with some remarkably large bushes of *Euphorbia dendroides*. *Erica peduncularis* was very plentiful on the rocks, and still in flower; also *Orsinia camphorata* and *Rhamnus oleoides*, which flower later in the season; a *Lotus* allied to *L. creticus*, and in the more shady places *Lycopodium denticulatum* and *Adiantum Capillus-Veneris*.

Ophrys bombyliflora and *O. fusca* occurred here and there in thick patches; *Polygala monspeliaca*, *Linaria reflexa*, and *Malva cretica*, more sparingly; also *Myrtus communis*, *Rubia peregrina*, and *Clematis cirrhosa*.

On some wet ground at the source of a small stream I gathered *Melilotus messanensis*, *Scirpus globiferus*, *Carex distans*, and another very beautiful *Carex*, which perhaps may be the *C. serrulata*, Biv. From here I soon reached the cliffs on the western side, where the vegetation becomes very scant and stunted. I gathered several specimens of a curious form of *Euphorbia pinea*, which I should have been inclined to consider a distinct species had I not met with intermediate forms on a less barren soil.

Gozo.—The island is 9 miles in length and about 4½ broad. Its surface is very uneven, and there are several very curious flat-topped hills, which at first sight suggest volcanic action, but the peculiarity of their shape is easily accounted for by the fact of their being capped with a hard limestone overlying marl. Some of the hills assume a conical form, as for instance in the neighbourhood of Marsa al Forno, showing that they have been denuded of their upper covering of coral limestone, and thus unprotected will soon be weathered to a level with the surrounding ground.

In nearly every part of the island there are good localities for collecting plants. Those which are worthy of special mention are the "Gorge of Wied Xlendi," on the south coast, the district about Cala Dueira, and Ramla Bay.

Wied Xlendi is a narrow, rocky ravine, which receives the water from a little valley called Wied el Lunziata, close to Rabbato, the chief town of the island. Its rocky sides are profusely clothed with rare and beautiful plants, such as:—

Silene fruticosa, *Hypericum ægyptiacum*, *Orsinia camphorata*, *Conyza Tenorii*, *Euphorbia melapetala* and *E. dendroides*, *Antirrhinum siculum*, *Calendula sicula*, *Malva hirsuta*, Presl., and *M. cretica*, *Psoralea bituminosa*, *Ruta bracteosa*, *Scrophularia peregrina*, *Lotus creticus*, *Seriola ætnensis*, *Smilax angustifolia*, *Sonchus tenerrimus*, *Teucrium fruticans*, *Vicia leucantha* and *V. cuneata*, *Melica minuta*, *Lathyrus tenuifolius*, *Allium subhirsutum*, *Convolvulus italicus*, *C. pentapetaloides* and *C. siculus*, *Medicago lappacea*, *C. orbicularis* and *C. recta*, *Trifolium resupinatum*, *T. stellatum*, and *T. scabrum*, *Micromeria microphylla*, *Lagurus ovatus*, *Echium calycinum* (and others), *Hedypnois tubæformis*, &c.

The base of the gorge is filled with various kinds of fruit trees, which seem to thrive well in such situations. In a shady crevice of the rocks there is an abundant growth of *Scolopendrium Hemionitis*, which I discovered here in 1872. It is growing with some very fine plants of *Adiantum Capillus-Veneris*. On the rocks, especially near the sea, there is a curious variety of *Hyoseris lucida*, with very fleshy leaves; it is a striking-looking plant, and very different at first sight from the ordinary *H. lucida*. I have found it plentifully at other parts of the coast. On some of the grassy ledges *Ophrys bombyliflora* and *O. fusca* are common plants; and this year the *O. Speculum* has been most abundant, whereas in 1872 I was the first to record its existence in these islands. Such was the case also with another

Ophrys, the *O. lutea*, which appeared in such profusion two years ago in Malta in the Cotonera district. There seems therefore to be a certain periodicity in years with regard to the flowering of these plants. Dr. Gulia spoke to me also of the unusual abundance this year of *Orchis saccata* on the Corradina Hill, in Malta.

On some rocks immediately overhanging the bay of Xlendi I noticed some plants of *Daucus rupestris* and *Senecio crassifolius*, and on level ground near the tower fine specimens of *Hedysarum capitatum*, and near here *Lygeum spartum* and *Plantago macrorhiza*. *Thesium humile* grows in the corn fields about here, together with *Valerianella eriocarpa*.

Cala Duiera is a small bay or creek at the western extremity of the island. Close off its entrance lies the curious rock known as the Fungus or General's Rock (Hágret el General), a locality for the once famous *Cynomorium coccineum*, or "Maltese fungus." The coast-line to the south consists of precipitous cliffs, which rise to a great height above the sea. In some places they are thickly clothed with plants, many of which are well worth procuring with a little risk, such as—*Matthiola sinuata*, *Daucus rupestris*, *Helichrysum rupestre*, *Silene sedoides*, *Euphorbia melapetala*, *Alsine procumbens*, *Hyoseris lucida* var., *Calendula sicula*, *Obione* sp., &c.

Cala Dueira itself is only a small bay in a much larger indentation of the coast into which several gullies open. The *Senecio pygmæus* is more or less plentiful in all of them, also *S. crassifolius*, which abounds on this side of the island, varying in size from about an inch to a foot, according to locality. Amongst others worthy of mention are *Ophrys Speculum*, *Malva cretica*, *Catapodium siculum*, *Phalaris præmorsa*, *Polypogon maritimum*, *Hedypnois cretica*, *Astragalus hamosus*, and *A. sesameus*.

In wet places—*Melilotus messanensis*, *Sium stoloniferum*, *Samolus Valerandi*, *Cyperus juncifolius*, *Carex divisa*, &c.; and in the streams are *Ranunculus aquatilis* (two vars., *R. Baudotii* and *R. trichophyllus*), *Zannichellia*, *Callitriche*, and *Chara*.

Ramla.—This is certainly one of the best spots in the island for collecting. The valley of Ramla extends in a northerly direction from the neighbourhood of Nadur for nearly three miles, till it reaches the bay, where it terminates in a broad expanse of sandy ground. The following are some of the plants I gathered here:—

(1.) On the marl—*Stellaria grandiflora* (Guss.), *Tamarix africana*, *Medicago ciliaris*, *Scorzonera octangularis*, *Senecio pygmæus*, *Phalaris præmorsa*.

(2.) On sandy soil—*Polycarpon alsinifolium*, *Erodium laciniatum*, *Ononis ramosissima*, *O. variegata*, *O. mollis*, *Medicago lappacea*, (a sp. allied to *striata*), and *M. tribuloides*; *Lotus pusillus*, *Orlaya maritima*, *Galium murale*, (var. *b. Guss.*), *Œthiorhiza bulbosa*, *Euphorbia Paralias*, *E. terracina*, *Pancratium* sp. (not in flower), *Schœnus mucronatus*, *Catapodium siculum*.

(3.) On rough stony ground:—*Valantia hispida*, '*Ecballion Elaterium*, *Statice* sp. (not in flower).

Vegetation of the Smaller Islands.—On the 20th of April I visited Comino and Cominetto, which lie about midway between Malta and Gozo. They are composed of coral limestone, being higher portions of the depressed tract previously alluded to. I landed first on *Cominetto*, which is the smaller of the two. The island being entirely free from cultivation, I thought it worth while to note down every plant I saw. The following, therefore, is not far from being a complete list of the flowering plants to be found in this small island during the month of April:—*Œthiorhiza bulbosa*, *Althæa hirsuta*, *Anagallis arvensis*. *A. cærulea*, *Anthyllis Hermanniæ*, *Asparagus acutifolius*, *Astragalus hamosus*, *A. sesameus*, *Buphthalmum spinosum*, *Brachypodium Plukenetii*, *Catapodium siculum*, *Chlora perfoliata*, *Cineraria maritima*, *Convolvulus althæoides*, *C. Cneorum*, *Coronilla scorpioides*, *Conyza Tenorii*, *Crucianella* sp., *Crassula?* sp., *Daucus rupestris*, *Echium* sp., *Erodium malachoides*, *Erythræa pulchella?* *Euphorbia exigua*. *E. pinea*, *E. peploides*. *Evax pygmæa*, *Frankenia intermedia*, *F. pulverulenta*, *Hedypnois mauritanica*, *Hippocrepis ciliata*. *Hyoseris scabra*, *Inula crithmoides*, *Kœleria phleoides*, *Linum gallicum*, *L. strictum*. *Linaria reflexa*, *Lagurus ovatus*, *Lepturus incurvatus*, *Lactuca spinosa*, *Lotus creticus?* *Malva cretica*, *Melilotus compacta*, *Medicago recta*, *M. striata?* *Mesembryanthemum crystallinum*, *Micromeria microphylla*, *Ononis mollis*, *Orobanche* sp. (on *Daucus*), *Plantago commutata* (Guss.), *Poa rigida*, *Romulea* sp., *Ruta bracteosa*. *Sedum litoreum*, *Senecio pygmæus*, *Seriola ætnensis*, *Scopiurus subvillosa*, *Silene sedoides*, *Sonchus oleraceus*, *Statice* sp., *Trifolium scabrum*, *T. stellatum*, *Trigonella monspeliaca*, *Teucrium fruticans*, *Urginia Scilla*, *Valantia muralis*, var. *hirsuta*, *V. hispida*.

Comino is a much larger island, and I had time only to explore a small portion of it, towards the north, where there are two sandy bays which afford promising-looking ground for rarities. Further round to the east the coast rises gradually to high cliffs.

In my note-book I find the following remarks on the vegetation of this island:—

Anthyllis Hermanniæ and *Euphorbia melitensis* plentiful on the open rocky ground. *Orchis fragrans* tolerably abundant here and there, usually occurring in pairs. *Convolvulus italicus*, *Chlora perfoliata*, and *Bartsia Trixago*, more sparingly.

On sandy ground by the sea:—*Lotus pusillus*, *Medicago marina*, *Trifolium resupinatum*, *Ononis ramosissima*, *Polycarpon alsinifolium*, *Rumex* sp., *Carex divisa*, *Stipa tortilis*, &c.

The cliffs to the east of the bay, called "Porto Sta. Maria," were bright with *Senecio vernus*, and here also I found a few specimens of an *Erophila* which I have not yet been able to determine. On returning to the place where I landed I had to pass over some sloping rocky ground above the bay of Santa Maria, and was much pleased to find several plants of *Hippocrepis ciliata*, also a few specimens of *Ononis ornithopodioides*, and some white-flowered *Malva cretica*.

I was surprised not to find on these islands either of the Helianthemums, of which *H. ericoides* is so plentiful on the adjacent coast of Malta, whilst *H. Barrelieri* is equally abundant along the eastern shores of Gozo.

I have still a few doubtful plants to determine, and which I hope shortly to be able to give an account of; as well as to make a few remarks on some interesting species not included in the above lists, and to mention the additions to the Maltese flora which I made during my visit this year.

NOTES ON SOME PLANTS OF THE NEIGHBOURHOOD OF PLYMOUTH, WITH STATIONS.

By T. R. Archer Briggs, F.L.S.

Ranunculus circinatus, Sibth.—In plenty in a tributary of the Erme River immediately above Gutsford Bridge, between Ermington and Kingston, 1874. Apparently very rare in the extreme south-west of England, like several other aquatic species common in other parts.

Brassica campestris, L., annual form of? (*vide Journ. Bot.*, *N. S.*, vol. ii., pp. 99, 100.) This has been noticed during the past summer in several places. It grows generally in arable land amongst crops of turnips, rape, mangold-wurzel, or potatoes, sometimes in considerable quantity; and likewise occurs casually in waste spots near homesteads or fields, where manure is occasionally deposited. &c. It must, I believe, come in either under *campestris* (where Watson has placed it) or *Rapa*, since the early and more or less hispid leaves are of a lighter green than the others. Doubtless it occurs in other counties besides Devon and Cornwall, and I much suspect that it stands for *B. Napus*, the Rape, in many local lists, especially as the early leaves very soon decay, leaving only the decidedly glaucous later ones. Unlike a biennial plant, which we have in a few spots, and which is unquestionably identical with the Thames-side *Brassica*, it produces only very few of the grass-green lower leaves, entirely wanting the rosette so conspicuous in the younger state of this other.

Cerastium semidecandrum, L. On a sand-bank at Mothecombe, growing with *C. tetrandrum*, Curt., May, 1874. The latter is rather common on the coast, and elsewhere near salt-water, in the neighbourhood of Plymouth, but *C. semidecandrum* is very rare.

Hypericum dubium, Leers. This is very rare, but still grows in several spots on both sides of the Tamar, a little below the Weir Head, and so occurs here in both Devon and Cornwall. It was found by the Rev. W. S. Hore, on the Cornwall side many years ago.

Hypericum hircinum, L. In two or three spots on hedgebanks near Penquit, between Ivybridge and Modbury; also two old bushes on a bank by the turnpike-road, between Yealm Bridge and Ermington village; probably sprung from the seed of cultivated plants, rather than planted originally at these places. Careful examination of specimens and comparison with a Kew specimen of *elatum* has shown this Devon *Hypericum* to be *hircinum*. It may be worth while to mention here that Devon alone of all the counties of the United Kingdom produces all the native British species of this genus. The most easterly English station known for *H. bæticum* is Ivybridge, about eleven miles to the east of Plymouth; the most westerly in the Peninsula for *H. hirsutum* is Yealmpton, seven miles from this town in the same direction.

Ulex Gallii, Planch. This ascends to 1300 feet on Dartmoor.

Lotus hispidus, Desf. This, together with *L. diffusus*, is far more general in old unbroken land, patched with furze, on the southern coasts of Devon and Cornwall, than the books would lead one to suppose. The two often occur together, consequently I was somewhat surprised to find no mention of *diffusus* in the recently-published "Flora of Dorset," though *hispidus* is said to be "common." About Plymouth I have never seen either at more than three-quarters of a mile from salt-water.

Rubus Balfourianus, Blox. In a waste spot by the road leading from Callington to St. Germans, between Clapper Bridge and the hamlet of Blunts, East Cornwall. New to the county. This plant agrees well with the one growing at Kingston, South Devon, which has been confirmed by Babington as *Balfourianus*. (*Vide* "British Rubi," p. 260.)

Agrimonia odorata, Mill. Rather common in South-west Devon and South-east Cornwall, so that I have some dozens of stations in both districts on record. Even when out of flower its agreeable odour alone is sufficient to enable one to distinguish it from *A. Eupatoria;* it has, moreover, leaves of a deeper green, with the leaflets considerably longer and less flat, and longer and more silky hairs over both leaves and stem, though these are less densely placed than in the other, making it look altogether less woolly and more silky. In fruit other differences become apparent.

Leontodon hispidus, L. Quite a local species about Plymouth. In Cornwall I have seen it only near Calstock.

Hieracium boreale, Fries. Sparingly amongst furze in an unenclosed spot below the hill with the old camp on its summit at Cadsonbury, in the parish of St. Ive, near Callington. New to East Cornwall. It is absent from a considerable portion of South Devon. In the extreme South-west of England *H. umbellatum* is the commonest species of the genus after the generally-distributed *Pilosella*. I have never seen *H. sylvaticum* here.

Mentha sylvestris, L. In a damp sandy spot by the Notter River, immediately above Notter Bridge, Cornwall, also on a hedgebank at Seaton, in the parish of St. Germans, in the same county; doubtless derived originally from gardens at both places. The Seaton plant is considerably more woolly than the other, and seems to agree best with the variety *mollissima*, Borkh. On a hedgebank by the lane opposite to the one on which it grows *Mentha rotundifolia* occurs, a species, unlike *sylvestris*, rather uncommon in Devon and Cornwall, though at most of the spots where I have seen it looking more like an introduced than a truly indigenous plant.

Mentha hirsuta, L. A variety with white flowers occurs by Hay Lane, Antony, East Cornwall. Are not white-flowered varieties very uncommon in *Mentha*, although rather frequent in several species belonging to other genera in *Lamiaceæ?*

Mentha Pulegium, L. In considerable quantity in several fields near Lambside in the parish of Holbeton, but rather as a denizen than a native.

Ruscus aculeatus, L. Very rare about Plymouth, but having all the appearance of an indigenous species on some bushy declivities on each side of the Erme estuary.

Agrostis setacea, Curtis. This occurs at over 1450 feet near Sheltop on Dartmoor, and so ascends far into Watson's zone 2.

All the places named above are in South Devon, unless the contrary is stated.

SCIRPUS TRIQUETER, LINN., IN SOUTHERN CHINA.

BY H. F. HANCE, PH.D., ETC.

IN the month of November, 1866, Mr. T. Sampson gathered on the muddy banks of the Canton River, growing abundantly between high and low water mark, a species of *Scirpus* which appeared to me on examination perfectly distinct from any of those occurring in this neighbourhood. A specimen or two were forwarded to Kew, where they were referred by Mr. J. G. Baker to *S. mucronatus*, Linn., which is not uncommon in southern China. On ascertaining this, I submitted the plant to a renewed and very careful examination, but its whole aspect—the differently shaped, bordered, and distinctly 1-nerved glumes—the larger, paler, lenticular achene and 2-cleft style—compelled me to dissent from Mr. Baker's opinion, and left a strong conviction in my mind that the Chinese plant is identical with the European *S. triqueter*, Linn. (*S. Pollichii*, Godr. & Gren.) A subsequent comparison with specimens of the latter from Strasburg, distributed under n. 1083 in Billot's "Flora Galliæ et Germaniæ exsiccata," for the communication of which I am indebted to Dr. Trimen, leaves apparently no room to doubt the justice of my conclusion; the sole difference I can detect between the Chinese and Alsacian specimens being that the leafy limb of the upper sheath is more developed in the former. The fact is worth putting on record, because of more interest from a phytogeographical point of view than might at first sight appear. Leaving out of consideration the occurrence and distribution of the species in Africa, America, and Australasia, *S. triqueter* is found in Europe—in Switzerland, in nearly the whole of Germany, in Belgium and Holland, in Scandinavia only in the extreme south of Denmark, throughout France, in England, in northern and central Italy, perhaps in the Morea and the Cyclades, in Hungary and Transylvania, and as far eastward as the Circassian provinces, where its progress in that direction appears to be abruptly arrested. Though recorded from Portugal, its presence in the Iberian peninsula, as also in Sicily, may be considered problematical.* I can find no evidence of its existence anywhere on the vast Asiatic continent. Dr. Hooker, in his "Tabular View of the Distribution of Arctic Plants,"† excludes it from the whole of Asia, from the Arctic circle to the Equator; and notwithstanding the active researches of Russian botanists during the past twenty years in north-eastern Asia, it has not hitherto been detected in any portion of Siberia, Manchuria, Mongolia, North China, the island of Sachalin, or Japan. Its occurrence in southern China is therefore sufficiently remarkable. I should mention that Dr. Trimen informs me that in the herbarium of the British Museum there is a *Scirpus* collected in the Chinese province of Shantung by Sir George Staunton, and labelled *S. triqueter;* but he adds that the specimens are imperfect, and that he cannot be sure they are properly named.

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* Nyman, Syll. fl. Europ., 390; Watson, Compend. Cyb. Brit., 360; Andersson, Cyperogr. Scandin., 7; Ledeb., Fl. Ross., iv., 248; Tchihatcheff, Fl. As. Min., ii., 571; Parlat., Fl. Ital., ii., 93; Willk. & Lange, Prodrom. fl. Hisp., i., 133.

† Trans. Linn. Soc. xxiii., 306. It is somewhat curious that, in his "Student's Flora of the British Islands," Dr. Hooker, while giving as the distribution of *Scirpus maritimus*—"Arctic Europe, N. Africa, W. Siberia, N.W. India, N. America"—assigns under the same head to *S. triqueter* only "Europe, from Denmark southwards." This would naturally lead a tyro in botany to suppose that the species is not found out of Europe.

REVISION OF THE BRITISH COLLEMACEI.

By the Rev. J. M. Crombie, F.L.S., &c.

In many respects the species belonging to the family of the *Collemacei* are amongst the most intricate, and perhaps the least understood, of any in British Lichenology. This no doubt is owing partly to the specific differences being in some cases not very readily perceptible, partly to the difficulties connected with confusion of synonomy by authors, and partly to numerous varieties and forms having been overlooked by our lichenists. Chiefly, however, it arises from inattention to the microscopical characters of the thallus and fructification, to which these other causes are primarily and mainly to be attributed. Having for some time past been engaged in working up the British species of this rather perplexing family, it may therefore be both interesting and useful to give the following results, derived partly from my own observation, and partly from communications from Dr. Nylander. Though in the number of species and varieties to be recorded, some of which have not yet been detected elsewhere, Great Britain and Ireland compare very favourably with other European countries, there are at the same time several Continental species absent from our list, some of which further research will no doubt bring to light. Probably also some representative of the genus *Pterygium* may yet be detected amongst the Scottish Grampians, though *Omphalaria* evidently does not extend so far to the north, nor *Phylliscum* so far to the south, as any parts of our islands. It is certain, however, that when the limits of the family are extended by the definite reception of many of the "pseudo-algæ" our Lichen-Flora will receive from these a goodly proportion of additions. In what follows we adopt the arrangement of Nylander, giving also the different sections or *stirpes* into which his genera have been or may be divided, and which here, as elsewhere, correspond so far unto, though much more natural than the so-called genera of most Continental lichenists, the nomenclature of which derives its chief claim to be preserved simply *memoriæ causa.*

Tribe I. Lichinei.

There can now be little doubt that many of the filamentose "Algæ," as originally suggested by Nylander (*vid.* also Cromb. "On the Lichen-gonidia Question," in *Popular Science Review*, No. 52), are referable to this tribe, though, being as yet known only in an undeveloped or barren state, they cannot at present be accurately or specifically described as lichens.

I. Gonionema, *Nyl.* To this genus belong various species of

Scytonema, which, for the reason just mentioned, are temporarily omitted. *Sp.* 1. *G. velutinum* (Ach.): probably not very uncommon in the mountainous tracts of Great Britain, though extremely rare in fruit, and consequently with difficulty distinguishable from states of other allied *Scytonemas*.

II. Spilonema, *Born*. To this similarly are to be referred the several species of the old "algal" genus *Sirosiphon*, most of which occur only in a barren condition, and one of which, *Sirosiphon saxicola*, Naëg., a plant of almost universal distribution in one or other of its states is evidently resolvable into two distinct species of *Spilonema*. *Sp.* 1. *S. paradoxum*, Born., rare and local, at least in fruit, in W. maritimo-montane Britain, in N. Wales and N. Argyleshire. *Sp.* 2. *S. revertens*, Nyl. On micaceo-schistose mountain rocks, usually associated with other lichens, seen only in a barren state, and consequently not certain on Ben Lawers and Craig Tulloch. To this is referable *Sirosiphon saxicola*, Naëg, *pro p.* *Sp.* 3. *S. scoticum*, Nyl. On micaceo-schistose rocks, probably frequent, though very rarely met with in fruit on Ben Lawers. To this also is referable *Sirosiphon saxicola*, Naëg., *pro max. p.* Though these two latter species, viewed as Algæ, would in an infertile state appear identical, yet viewed as Lichens, their fructification shows that no two species can be more distinct.

III. Ephebe, *Fr.*, *Born*. In a young and undeveloped state this can be distinguished from the preceding only on a microscopical examination of the thallus. *Sp.* 1. *E. pubescens* (L.), Fr. Very abundant in the Scottish Highlands, but rarely seen in fruit, and more frequently with spermogones than apothecia. This is the *Lichen exilis* of Lightfoot, as proved by specimens in the older herbaria (e.g. Pulteney's, &c.); while on the other hand the *Lichen pubescens* of our older writers is *Alectoria lanata*, var., *parmelioides*, Cromb., as appears from the same sources. Probably *E.p.* var. *spinulosa* (Th. Fr.) will also be detected amongst the Grampians.

IV. Lichina, *Ag.* *Sp.* 1. *L. pygmæa* (Lghft.); *Sp.* 2. *L. confinis*, Ach. For British distribution of these *vid.* Leight., Br. Lich. Fl., pp. 13, 14. The former is most frequently seen on the W. coasts of Britain to the N. Hebrides; and the latter on the E. coasts, where from the Firth of Forth northwards it seems to be the only species which occurs.

Tribe II. Collemei.

This tribe also includes some species of "Pseudo-algæ," viz., the *Nostocs*, which there can be little doubt are merely undeveloped states of *Collemas* (vid. Cromb. in *Popular Sc. Rev.* l.c., p. 272).*

I. Pyrenopsis, *Nyl.* This genus, as recently limited by Nylander, is confined to those species which have the thallus internally rubricose and the gonimia in globular cells. *Sp.* 1. *P. hæmatopis* (Smmrf.), distinguished very readily from the following by its urceolate apothecia. *Sp.* 2. *P. hæmalea* (Smmrf.), not uncommon on Ben Lawers and its ridges, and formerly not rightly distinguished by me from the preceding. *Sp.* 3. *P. granatina* (Smmrf.), apparently a very rare British plant, characterised by the nodulose and irregularly rotundate granules of the thallus, and by the apothecia. *Sp.* 4. *P. homœopsis*, Nyl., extremely scarce on Ben Lawers, only a single other specimen having been found on the summit, notwithstanding a subsequent and protracted search. *Sp.* 4. *P. fuscatula*, Nyl. In the absence of any rightly-developed fructification, my specimen from Ben-y-gloe (vid. "Grevillea," I., p. 170), though sufficiently resembling this species as it occurs in the Channel Islands, cannot with absolute certainty be identified with it. *Sp.* 5. *P. furfurea*, Nyl., is to be removed from *Collema*, and may be placed in the present genus, though in the structure of the thallus it approaches to *Phylliscum*.

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* The opinion there expressed has been further confirmed by recent observations in Appin, where in several instances, and under circumstances which prevented any misinterpretation of the phenomena witnessed, we perceived on the one hand *Nostoc commune* passing into young *Collema pulposum*, and on the other hand the same *Collema* in an old decaying state degenerating into the *Nostoc*. We may, therefore, legitimately conclude with Nylander, that the *Nostocs* bear very much the same relation to the *Collemei* as the *Lepraria* to the *Lichenacea*.

II. Collemopsis, *Nyl.* This is sufficiently distinct from the preceding in having the thallus internally glaucous-green, and the gonimia submoniliformly arranged. *Sp.* 1. *C. Schæreri* (Mass.); beautifully developed on limestone of Craig Tulloch in Blair Athole, and much less so on chalk pebbles near Shiere in Surrey, where also a state occurs which seems referable to *Verrucaria Flotoviana*, Hepp. The absence of any proper hypothallus at once separates it from *Pannaria*, which otherwise it closely resembles. *Sp.* 2. *C. lecanopsoides*, Nyl. In my specimen from Craig Tulloch the spores are 0·010-16 × 0·007-9 mm. (with a nucleus in each), and thus smaller than in either the Irish or Pyrenean plants. *Sp.* 3. *C. furfurella*, Nyl., removed from *Collema* to the present genus, with the characters of which it well agrees. The thallus and the spores are but rarely well developed in the few British specimens seen. *Sp.* 4. *C. oblongans*, Nyl. (*vid.* "Grevillea," III., p. 22), a very interesting, though somewhat peculiar-looking species, allied to *C. Arnoldiana* (Hepp.) *Sp.* 5. *C. diffundens*, Nyl., apparently an extremely rare plant, for which we have searched in vain the neighbourhood of Maidstone, where it was originally gathered very sparingly by Admiral Jones.

III. Synalissa, *DC.* *Sp.* 1. *S. symphorea*, DC. This species seems now to be extinct in both the recorded British localities.

IV. Collema, *Ach.* This genus is now somewhat limited by the abstraction of some species formerly included in it, not merely to the preceding but also to the following genera, in which they find a more natural place. It may be divided into these sections:—

A. *Lichinopsis*, Cromb.=stirps *C. lichinodei.*

Sp. 1. *C. lichinodeum*, Nyl. Probably this species belongs to a distinct genus, which may be named as above, though as the fructification is at present entirely unknown, it is best retained as constituting a separate section of *Collema*.

B. *Physma*, Mass. *a.* stirps *C. myriococci.*

Sp. 2. *C. chalazanum*, Ach., distinguished from its allies chiefly by its *ellipsoid* spores; rather local and not common where it occurs in W. Britain and S.W. Ireland. *Sp.* 3. *C. chalazanodes*, Nyl., intermediate, as it were, between the preceding and the following species, with larger subglobose spores. *Sp.* 4. *C. myriococcum*, Ach. This species is with difficulty to be distinguished from these other two, and probably all three are referable to one and the same somewhat variable species.

b. stirps *C. lepidei.*

Sp. 5. *C. confertum*, Ach., apparently a very rare British species, and not gathered as such since the days of Turner.

C. *Eucollema*, Cromb. *a.* stirps *C. terrulenti.*

Sp. 6. *C. terrulentum*, Nyl. The apparently constantly granulose thallus warrants the arrangement of this somewhat peculiar and very rare species in a separate subsection.

b. stirps *C. verrucæformis.*

Sp. 7. *C. ceraniscum*, Nyl., an extremely rare plant of Ben Lawers, of which, subsequent to its discovery by Admiral Jones, I gathered only a single small specimen, near the same spot where it was first detected.

c. stirps *C. pulposi.*

Sp. 8. *C. auriculatum*, Hffm. This according to the authentic specimen ex hb. Sowerby in Hb. Mus. Br. *manu* Borrer, is entirely identical with *C. dermatinum*, Borr. F. *membranacea*, Kphlb., apparently rare in the S.W. Highlands near Inveraray. Var. *pinguescens* Nyl., rare at Finlarig, Killin, and Craig Tulloch, Blair Athole. *Sp.* 9. *C. furvum*, Ach. The true plant, which is best distinguished by the reaction with I. from the other species, with which it might be confounded, does not appear to be at all common in this country. F. 1. *tunæforme*, Ach., is characterised merely by having the lobes of the thallus longer and more deeply incised. *Sp.* 10. *C. pulposum*, Bernh. This is a very variable species of which the following forms and varieties occur in Great Britain and Ireland:—F. 1. *granulatum*, Sw., distinguished by the lobes and the margins of the apothecia being more or less granulated—probably not unfrequent in limestone tracts, but rarely fertile. F. 2. *compactum* (Ach.), known by the closely-imbricated thallus and the immersed apothecia, apparently rare in S. and W. England, and hardly fertile, though spermogoniferous. F. 3. *hydrocharum* (Ach.), on damp calcareous rocks of Craig Tulloch, very sparingly and infertile. Var. 1. *ceranoides*, Borr. This, according to the fragment of the original specimen in Hb. Sowerby, attached to the fig. drawn for E.B., seems to be referable to the present species, but the characters of the plant in Hb. Borr. at Kew are not very definite. Var. 2. *pulposulum*, Nyl., a much smaller plant than the type, apparently very rare and as yet gathered only near Cirencester. *C. tenax*, Sw., differs chiefly in the innate apothecia, and is scarcely to be regarded as a distinct species; rare in upland mountainous districts. *Sp.* 11. *C. subplicatile*, Nyl. (*C. plicatile*, Arn. in Flora, 1867 *pro p.*), sufficiently similar to *C. pulposum* but with much larger spores, as yet gathered only sparingly at Appin, but no doubt to be detected elsewhere. F. 1. *meizolobum*, Nyl. (*C. flaccidum*, var. *microlobum*, Nyl., *olim* in Cromb. Enum., p. 5), differs in having the lobes of the thallus larger, rare at Killarney. *Sp.* 12. *C. limosum*, Ach., easily recognised from the allied species by the adglutinated evanescent thallus, and the appressed thinly-margined apothecia, no doubt frequently overlooked, at least in S. England. *Sp.* 13. *C. crispum* (Huds.), probably not uncommon, though the true plant is but rarely seen in hbb. Var. 1. *cristatulum*, Nyl., easily recognised by the microphylloid thallus, occuring in the Channel Islands and probably also in S. England. *Sp.* 14. *C. cheileum*, Ach., common where it occurs, generally on old walls near water, but often barren. F. 1. *nudum* (Schær.), distinguished by the broader egranulose lobes, apparently rare, as at Killin and in S. Ireland. F. 2. *monocarpon* (Duf.), with microphylline or nearly obliterated thallus, near Cirencester, and probably overlooked elsewhere. *Sp.* 15. *C. melænum*, Ach., a common and rather variable species, of which the following forms are sparingly found in Britain and Ireland. F. 1. *marginale* (Huds.), probably not very uncommon, though not sufficiently distinguished in more recent hbb. from the type. F. 2. *jacobæifolium* (Schrank.), apparently rare in the Channel Islands and in S.W. Ireland. F. 3. *gyrosum*, Ach., seen by us only very sparingly on Craig Tulloch, and only a few old apothecia present on the specimen gathered. F. 4. *complicatum*, Schl., Schær., closely allied to the preceding, and rare in N. England and the S. W. Highlands. All these forms appear to be connected by intermediate states, some of which can with difficulty be referred to any of them in particular. *Sp.* 16. *C. cristatum* (Hffm.), Schær., differs from the preceding, though perhaps only as a subspecies, in the imbricato-aggregated laciniæ, and the slightly different character of the spores, probably not very rare in upland tracts, though till recently overlooked as a British plant. *Sp.* 17. *C. polycarpon* Schær., distinguished by the small pulvinate thallus and the spores at length 3-septate, forming a transition to the next section, rare on Cheddar Cliffs, near Kendal and at Appin.

D. *Lathagrium* (Ach.). *a.* stirps *C. flaccidi.*

Sp. 18. *C. stygium* (Del.), similar to the preceding species, but with 3-5-septate spores, rare as near Cirencester, Kendal, and in Teesdale. *Sp.* 19. *C. Laureri* (Fw. Krb.), distinguished by having the thallus broader, and the spores 3-septate, and obtuse at either apex, but apparently a somewhat doubtful British Lichen. *Sp.* 20. *C. flaccidum*, Ach., generally distributed in mountainous districts, on mossy old walls and trunks of trees, but very rarely seen in fruit. *Sp.* 21. *C. fasciculare* (Linn.), easily recognised by the fasciculate lobules of the thallus and the biatorine apothecia, frequent about Barcaldine in Lorn. *Sp.* 22. *C. multipartitum* (Sm.), pretty generally distributed in upland limestone districts, but nowhere common, unless (*fide* Taylor) in S.W. Ireland about Dunkerron.

b. stirps *C. nigrescentis.*

Sp. 23. *C. nigrescens* (Huds.) Hudson has priority of name (Fl. Angl. ed. i. p. 450), otherwise the more expressive one of Lightfoot might have been adopted, and the plant been called *Collema Vespertilio* (Lghft.) *Sp.* 24. *C. aggregatum* (Ach.), a very rare species in this country, though we have gathered it also very sparingly near Tunbridge Wells.

E. *Leptogiopsis*, Cromb. = stirps *C. microphylli.*

In this section the thallus is nearly as in *Leptogium*, but the apothecia are those of *Collema*, so that it forms a natural transition between the present and the following genus. *Sp*. 25. *C. biatorinum*, Nyl.—Pretty generally distributed in S. and W. England, but chiefly in chalk districts. *Sp*. 26. *C. microphyllum*, Ach.—occurs chiefly on old elms in S. England, and frequently appears in hbb. *s.n. C. fragrans* (Sm.)

V. Leptogium, *Ach.* To the species which, on a more accurate examination of the structure of the thallus, have from time to time been removed from *Collema* to the present genus, others have now to be added.

A. *Euleptogium*, Cromb. *a*. stirps *L. tenuissimi.*

Sp. 1. *L. amphineum*, Ach.—Will no doubt be found elsewhere in S. England, as, being a rather inconspicuous plant, it may readily be overlooked in dry weather. *Sp*. 2. *L. rhyparodes*, Nyl., very rare on Ben Lawers and the neighbouring ridges in its typical state, and still rarer on the summit of Ben Lawers in its less developed and more obscure state, which originally was named by Nylander *Collema psorellum*. *Sp*. 3. *L. tenuissimum* (Dcks.) = *L. spongiosum*, Nyl. (not *tenuissimum*, Scand., p. 34), by no means a common British lichen, and apparently always very sparingly where it does occur.

b. stirps *L. cretacei.*

Sp. 4. *L. fragile* (Tayl.) This rare Irish species is externally somewhat similar to young states of *Collema multipartitum*, but the character of the cortical stratum and of the apothecia is widely different. *Sp*. 5. *L. cretaceum* (Sm.) Unquestionably a very rare British species, an extensive search over various of the chalk districts of S. England having failed to detect it except in one locality, viz., the chalk quarry on Reigate Hill, Surrey. *Sp*. 6. *L. pusillum*, Nyl., also very rare in this country, with the structure of the thallus almost as in section E. of the preceding genus, distinguished from *Collema biatorinum* by the thalline exciple and the character of the spores.

c. stirps *L. tremelloidis.*

Sp. 7. *L. lacerum* (Sw.), generally distributed, but by no means common in fructification. F. 1. *fimbriatum* Hoffm., probably not very rare, but scarcely ever seen in a fertile condition. Var. 1. *pulvinatum* (Hoffm.), most frequently fruited in the S.W. Highlands. Var. 2. *lophæum* (Ach.), occurs also sparingly in the Channel Islands. Var. *tenuissimum*, Nyl., will no doubt also be detected in this country, and indeed we have a specimen from Appin which, except in a slight difference in the size of the spores, seems sufficiently identical. *Sp*. 8. *L. subtile* (Schrad.), evidently a rare British plant, which must carefully be distinguished from *L. tenuissimum*, and all the somewhat similar states of the preceding species. *Sp*. 9. *L. sinuatum* (Huds.), chiefly in upland limestone districts, and not unfrequent in the S.W. Highlands. F. 1. *Polinieri* (Del.), easily recognised by the bright green thallus, an Irish form, rare on Dunkerron and near Cork. Var. 1. *crenulatum*, Nyl., distinguished by the thallus being smaller, and crenato-incised at the margin, intermediate between the type and *L. lacerum*. To this ex. Hb. Mudd, is referable *L. fragrans* from Cleveland, which (*vid.* Man. p. 46), he suspects to be a cortical var. of *L. subtile*. *Sp.* 10. *L. plicatile* (Ach.) The structure of the thallus shows that this species must be removed from the genus *Collema*, in which it has hitherto been placed. It is identical with *L. firmum*, Nyl., Scand. p. 34, the description of which was evidently taken from one of the states presented by this species. Specimens from Taylor in Hbb. Brit. Mus. et Kew, *s.n. Collema fluviatile*, having the thallus smaller and, when dry, somewhat angulose, probably identical with *Collema fasciculare*, Smmrf., may be named f. *minor*, Cromb. *Sp.* 11. *L. palmatum* (Huds.), easily distinguished from *L. sinuatum* by the revolute margins of the laciniæ, most visible when the plant is moistened, and which are either broader or narrower, and linear. *Sp.* 12., *L. tremelloides* (Linn.), frequent also in most of the S. Hebrides, but apparently very rarely fertile in Britain or Ireland. *Sp.* 13. *L. fluviatile* (Huds.) = *L. rivulare* (Ach.) The structure of the thallus, so well described in Nyl. Syn., p. 112, shows that this also must be removed from the preceding to the present genus.

d. stirps *L. chloromelum.*

Sp. 14. *L. chloromelum* (Sw.), a very rare species in this country, which has only been gathered fertile in S. W. Ireland, at Killarney.

B. *Mallotium*, Fw.=stirps *L. saturnini.*

Sp. 15. *L. saturninum* (Dcks.)—Apparently confined to Scotland, where it occurs here and there in several parts of the Grampian range, but, in so far as I have seen, fertile only, and that very sparingly, in a ravine at Appin. *Sp.* 16. *L. Hildenbrandii* (Garov.). This is given in Hb. Mudd in Hb. Brit. Mus., *s.n. L. saturnini*, as from Teesdale, Harriman, from whom also a specimen, without any locality, appears in Hb. Sowerby, but it is probably not British. *Sp.* 17. *L. Burgessii* (Lghtft.). Very fine and abundant near lakes and streams throughout all the S.W. Highlands.

C. *Polychidium*, Ach. *a.* stirps *L. Schraderi.*

Sp. 18. *L. turgidum* (Ach.)—Confined apparently to S. and W. England, easily recognised from all states of *Collema pulposum* and *L. plicatile*, by its subfruticulose habit. *Sp.* 19. *L. Schraderi* (Bernh.), occurs also sparingly and infertile upon decayed mortar of old walls in Glenlyon, Perthshire. *Sp.* 20. *L. microscopicum*, Nyl., approaches in habit at least nearer to the preceding than to any state of *L. lacerum* while the discovery of the apothecia by me recently near Shiere, in Surrey, shows that it is not, as might have been suspected, an undeveloped state of some other species.

b. stirps *L. muscicoli.*

Sp. 21. *L. muscicolum* (Sw.), an easily recognised species alike from the character of the thallus and of the spores, to which the general and original Acharian name of this section has been exclusively appropriated by Continental lichenists.

VI. Leptogidium, *Nyl.* This genus has recently been separated by Nylander from *Leptogium* in consequence of having the gonimic granules moniliformly concatenated (*vid.* Nyl. Pyren. Or. p. 48). *Sp.* 1. *L. dendriscum*, Nyl. On submitting a specimen of *Leptogium Moorei*, Hepp, to Nylander he pronounced it to be entirely the present species. In all the specimens which I have seen in hb. Carroll and ex. hb. Jones, there are no apothecia present, and it is most likely that the anomalous apothecia hitherto described were simply the spermogones, though even these, which are not unfrequent in the specimens referred to, are scarcely rightly developed. This is another of those interesting exotic species, having previously been known only from Brazil, the Island of Bourbon, Papéiti, and New Caledonia, which find their way to S.W. Ireland.

VII. Pyrenidium, *Nyl.* According to Nyl. *in litt.*, if the apothecia are not parasitic, this ought to be included in a distinct tribe called *Pyrenidii*. *Sp.* 1. *P. actinellum*, Nyl., extremely rare, and as yet vainly searched for by myself and others around Maidstone and other likely localities. It is a very singular-looking species, so far as the thallus is concerned, but the only specimen I have seen, in hb. Carroll, is unfortunately barren.

N.B.—The genus *Obryzum*, being now ascertained to be entirely parasitic, is to be removed from the *Collemei* to the *Pyrenocarpei*.

SHORT NOTES.

Notes on the Flora of Herts.—I send some more examples of *Rumex sylvestris*, Wallr., from a fresh locality in the neighbourhood of Hertford, where they occurred at intervals along the roadside for the distance of a mile or more. In addition to the typical *sylvestris*, the specimens appear to present a series of intermediates tending to connect that plant with *R. Friesii*, as usually occurring, and thus linking the extreme forms. *R. pratensis* was growing in their company, as well as *R. conglomeratus* and the ordinary *R. obtusifolius*. The locality is at some distance (three to four miles) from that first discovered in the Ware brickfield, and is open to no suspicion of introduction; the plant will not improbably prove to be common in the neighbourhood.—I may take this opportunity of mentioning that the Rev. R. H. Webb has placed in my hands the task of collecting materials for the Herts Flora: so much additional information has been brought together that I have hopes that a new edition may be possible at no very distant period, for which I shall be individually responsible. To my last notice (Journ. Bot., N.S., iii., 22) I can add the following list, all plants which, to the best of my knowledge, have not been previously recorded for the county; for some of these I have to thank the kindness of correspondents:—*Ranunculus homœophyllus*, Ten. (Colney Heath); *R. radians*, Revel (Hitchin); *R. submersus*, Godr. (R. Lea, Mimran, &c.); *R.*

pseudo-fluitans, Syme (the common Batrachium of the Lea); *R. Ficaria* var. *incumbens*, F. Schultz (Hatfield); *Diplotaxis muralis*, DC., with its var. *Babingtonii*, Syme (Watford); *Erophila brachycarpa*, Jord. (Wilstone); *Viola Riviniana*, Reich. (abundant); *V. Reichenbachiana*, Bor. (not uncommon); *Geranium striatum*, L. (Hitchin); *Impatiens parviflora*, DC. (Bedwell); *Trifolium hybridum*, L. (Hertford, &c.); *Lathyrus sphaerious*, Retz (Cole Green); *L. latifolius*, L. (Hatfield); *Cratægus Oxyacanthoides*, Thuill. (Hatfield, Hitchin, Wilstone, &c.); *Arctium nemorosum*, Lej. (Hatfield); *Thymus Chamædrys*, Fr. (common); *Polygonum nodosum*, Pers. (Journ. Bot., ix., 37) (St. Albans); *Rumex sylvestris*, Wallr. (Hertford, Ware); *R. maximus*, Schreb. (Hatfield); *Chenopodium rubrum* var. *pseudo-botryoides*, Wats. (Ware); *Salix ramulosa*, Borr. (Wilstone); *Orchis incarnata*, L. (Hatfield, Welwyn, Hitchin, &c.; most of the recorded localities for *O.* "*latifolia*" in Herts probably belong here; it is the only form that I have seen.) *Potamogeton lucens* var. *acuminatus*, Schum. (Hertford).—*Papaver Lecoqii*, Lam., which seems to occur in several of the districts, had been previously given by Dr. Syme on the authority of the Rev. W. W. Newbould. *Viola canina*, L. (vera); specimens from this county have been authenticated by Dr. Syme. *Eruca sativa*, *Rapistrum rugosum*, *Dipsacus Fullonum*, *Cynoglossum Omphalodes* have also been recently met with. It is not improbable that botanists residing in neighbouring counties may have notes or memoranda relating to the Flora of Hertfordshire, and I shall be grateful for *any* information bearing upon the subject. I shall be happy to send to any one a list of queries and desiderata.—Since the above was written I have gathered *Rumex sylvestris* at Hatfield, growing by itself, which still further extends its distribution. The nut is quite that figured in the Journal of Botany (plate 131).—R. A. PRYOR.

ON A NEW VARIETY OF ROSA INVOLUTA (R. INVOLUTA *var.* WEBBII, *Baker*).—Mr. J. M. Webb has discovered, in August, 1873, in hedges near Hoylake, Cheshire, a noteworthy new variety of *Rosa involuta*, which I propose to call var. *Webbii*. It has the copious unequal straight prickles of the type, leaves like those of *Doniana* in size, shape, and serration, but quite naked on both sides, except that the midrib beneath is clothed with a few obscure adpressed hairs; common petiole furnished with copious aciculi and gland-tipped bristles, but scarcely at all pilose; peduncle and ovary entirely naked; sepals for the species unusually large and compound (in one of the specimens now before me all an inch long, with a dilated leafy point, the largest with three pairs of erecto-patent pinnæ) copiously gland-ciliated, but nearly naked on both faces; and oblong urceolate fruit entirely destitute of bristles and aciculi. It comes nearest the Belgian variety *subnuda* of Crépin, but that has leaves almost as densely glandular beneath as in the *Rubiginosa*. This is now the tenth marked variety of *involuta* that has been noted in Britain, varieties quite as distinct from one another as the forms of *canina* that have received specific names from Continental authors.—J. G. BAKER.

DIANTHUS GULIÆ, *Janka*.—Perennis, exceptis foliorum marginibus lævis; caules elati, recti, subteretes atque obsoletissime v. obliterate

4-anguli; folia lineari-subulata; flores cæspitoso-fasciculati, numerosi, bracteæ in quodam flore 6-7, *omnes calyce breviores*, parte dilatatæ ovato-lanceolatæ v. ovalæ coriaceæ *albidæ*, apice æquilongo, abrupte subulato-acuminato herbaceo; calyx multistriatus subtus bracteas æquans, dentes lanceolato-acuminati; petala pulchre lutea, sæpe subtus fulva, lamina imberbis quidem sed tota superficie velutino-pilosula calycem dimidium æquans. In herbidis dumosis planitiei prope Eboli non procul a Neapoli. Delevi d. 18 Maii 1874. Nominavi in honorem clarissimi Doctoris Gulia in scientia naturali peritissimi atque mox Floram insularum Melites edendi.—VICTOR DE JANKA in "Il Barth" (Maltese Medical and Scientific Journal) for 6th Aug. 1874.

OROBANCHE RAMOSA, L.—I send a small piece of this, which I have never before seen in a living state. It has made its appearance in a portion of the Botanic Garden, Glasnevin, where we usually sow hemp, upon which it is parasitic.—D. MOORE.

RUMEX MARITIMUS IN HEREFORDSHIRE.—The enclosed specimen was gathered within three miles of Hereford on marshy ground, the remains of Ingwas Pool.—H. G. BULL. [Additional to Topogr. Botany.—*Ed. Journ. Bot.*]

CHENOPODIUM RUBRUM IN MONMOUTHSHIRE.—This plant, not hitherto recorded as occurring in sub-province 35, was observed, in September last, growing plentifully along roadside banks between the bridge over the river Wye and the railway station at Monmouth.—A. G. MORE.

NEW BRITISH PLANTS.—We have been informed that during the excursion of the Scottish Botanical Alpine Club to the Aberdeen and Forfarshire mountains in August last, Mr. John Sadler discovered a singular alpine willow, which is to be described by Dr. Boswell-Syme under the name *S. Sadleri*. Mr. Sadler also discovered in the same district *Carex frigida*, All., growing in considerable quantity. These species are shortly to be described and figured by the Edinburgh Botanical Society.

CAULINIA SPINULOSA, *R. Br.*, has been hitherto only known by its foliage. Ascherson says that no better idea can be given of its habit than by stating that it resembles *Potamogeton densus* in almost all its characters, only differing by its very sharply and distinctly serrulate leaves; and that besides the type in Brown's herbarium from the shores of tropical Australia, he had seen specimens from the coast of the Philippine Islands collected by Cuming, and from Port Denison found by Baron F. v. Mueller and others. In the 68th part of his "Fragmenta Phytographiæ Australiæ" (p. 219), bearing date August, 1874, Mueller describes the fruit from specimens collected by Kilner at Port Denison, which show the plant to form a new genus of *Hydrocharideæ*, near *Thalassia*. He proposes to dedicate this to Dr. Ascherson, to whom botanists are so much indebted for his researches into the group of marine Endogens to which it belongs.

Extracts and Abstracts.

NOTES ON THE OCCURRENCE OF ALUMINIUM IN CERTAIN CRYPTOGAMS.

By A. H. Church, M.A.

All the more recent and exact analyses of the ashes of plants show that the element aluminium is not to be found amongst the constituents of flowering plants, and that its presence is confined to a few of the Cryptogams. During the last two years I have been endeavouring to give greater precision to our knowledge of this subject, and through the kindness of various friends, including Dr. Hooker, of Kew, and Dr. McNab, of Dublin, I have been enabled to secure authentic specimens of the different species of plants which I deemed it important to analyse. My researches are by no means finished, but I have obtained results of so interesting and decisive a bearing that I think they should be made known at once, even if incomplete.

In undertaking an enquiry of this nature there are three conditions of success which must be rigorously fulfilled: the plants must be absolutely freed from all extraneous matter previous to incineration; the process for the determination of the alumina must be accurate, and must not allow traces of this earth to escape precipitation; and the reagents and apparatus must not introduce any alumina. The first condition was fulfilled by a system of washing and brushing the various plants operated upon, and analysing the material experimented on in different stages of purification; it may be noted here that in the case of the plants in which aluminium occurs more was invariably found in the completely washed than in the partially washed samples. The second condition was answered by the use of the well-known sodium hydrate and barium chloride process, as described in my "Laboratory Guide," 3rd edition, p. 137; while the third condition merely required the use of pure reagents, such as sodium hydrate made from sodium, and of silver vessels instead of those of glass generally employed.

Before giving my chief results a word must be said as to the work already done in this direction. So far as I know, aluminium has not been detected in the ashes of any plants save four, or possibly five, and in one or two of these cases we lack information as to the purity of the reagents employed; indeed, in most of them we may be sure that the sodium hydrate was *not* prepared from pure sodium. On this account, I could not regard the recorded discovery of 1 or 2 per cent. of Al_2O_3 in the ash of some of the plants analysed as conclusive of the occurrence of this constituent amongst those essential to the plant itself. For instance, in 1856, Solms Laubach (Ann. Chem. Pharm., c., 297) found in the ash of the *Lycopodium denticulatum* of gardens (really a *Selaginella*, the *S. Kraussiana* of Kunze) 42 per cent. of silica and 2·0 per cent. of alumina, a small proportion, it will be seen, of the latter earth, and one due very likely to its introduction from the reagents and the glass vessels used. But when Ritthausen (Journ. Prakt. Chem., lviii., 13), in 1853, found 39·07 per cent. of alumina in the ash of *Lycopodium Chamæcyparissus*, and 20·69 per cent. in that of *L. clavatum*, it was obvious that there was no room to doubt the fact that alumina formed an important part of the fixed constituents of the plants analysed. Further, the above results confirmed others previously obtained (1851 and 1852), and have met since with general acceptance. What I have at present done has been to examine other species of the same genus, *Lycopodium*, and a few plants belonging to closely-allied genera.

My first experiments were made upon two British Lycopodia, *L. clavatum* and *L. alpinum*, abundant supplies of these club-mosses in fruit having been obtained from a mountain district in Westmoreland. A quantity of plants of each species was cleansed by careful brushing, and the material thus prepared was burnt and the ash analysed. Other portions were then brushed and washed in a stream of cold distilled water, and then burnt, the ash being examined as in the first instance. A third portion of each kind was then purified by the most thorough brushing and washing, so that every particle of foreign matter was entirely removed. The ash in the samples which had been brushed merely, and in those also which had been further purified, was greater in amount, but contained *less alumina*, than the ash of the completely purified samples. As further washing neither lessened the ash nor increased its percentage of alumina, it was considered that all extraneous matter had been removed. The following percentages were finally obtained:—

	Percentage of Ash in Dry Plant.	100 parts of Ash contained	
		Al_2O_3.	SiO_2.
Lycopodium alpinum . .	3·68	33·50	10·24
L. clavatum	2·80	15·24	6·40

These results really agree with those of Ritthausen; for *L. alpinum* is a species closely allied to *L. Chamæcyparissus*, in which he detected 39·07 per cent. of Al_2O_3, while my determination in the case of *L. clavatum* is not much lower than his, viz., 15·24 per cent. of Al_2O_3 in lieu of 20·69.

The next point to be settled was the absence or presence of alumina in the species of the closely-allied genus *Selaginella*. I obtained a good supply of *S. Martensii* var. *robusta* (the var. γ *compacta* of A. Braun), and thoroughly cleansed it previous to analysis. It gave:—

	Percentage of Ash in Dry Plant.	100 parts of Ash contained	
		Al_2O_3.	SiO_2.
Selaginella Martensii . .	11·66	0·26	41·03

Practically, this ¼ per cent. of Al_2O_3 must be regarded as accidental, and we may conclude that this constituent is absent from the plant in question.

Further, to see whether alumina is really distinctive of *Lycopo-*

dium, and is always absent from *Selaginella*, other trials were made. A quantity of another species of *Lycopodium*, *L. Selago*, was obtained from Westmoreland, and cleansed and burnt, with the following results:—

	Percentage of Ash in Dry plant.	100 parts of Ash contained	
		Al_2O_3.	SiO_2.
L. Selago	3·20	7·29	2·53

A result perfectly confirming my former conclusions, and the more particularly so, as the group of *Lycopodia* to which *L. Selago* belongs is separated from the group to which *L. alpinum* belongs by that to which *L. clavatum* belongs, thus:—

Botanical Series.		Order according to Percentage of Alumina.	
1 . .	*L. alpinum*	1 . . .	33·50
2 . .	*L. clavatum*	2 . . .	15·24
3 . .	*L. Selago*	3 . . .	7·29

Now there is a most interesting British *Selaginella*, the only species found in these islands, and a plant which has been ranged amongst the *Lycopodia* until the last few years, when it was separated on account of its mode of reproduction. This plant, formerly known as *Lycopodium selaginoides*, is now called *Selaginella spinulosa*. If the element aluminium be really confined to the genus *Lycopodium*, this plant ought not to contain it, and it does not according to the following analysis:—

	Percentage of Ash in Dry Plant.	100 parts of Ash contain	
		Al_2O_3.	SiO_2.
Selaginella spinulosa . .	3·44	none	6·67

A good supply of this plant was kindly obtained for me from Largo Links, Fife, by Mr. Howie of Largo.

Many points remain to be determined by further research concerning this occurrence of aluminium in species of *Lycopodium*. Is the proportion in any one kind as fairly constant in quantity as the other constituents of the ash? Is the element present in every kind of *Lycopodium?* I have commenced the study of another point connected with the present inquiry, and have searched for and failed to find alumina in the ashes of the following Cryptogams, more or less nearly related to *Lycopodium*:—

Equisetum maximum.
Ophioglossum vulgatum.
Psilotum triquetrum.

I hope to analyse species of *Phylloglossum* and *Tmesipteris*, two genera of *Lycopodieæ* closely allied to *Lycopodium*. *Isoetes*, also, which is separated from *Lycopodium* by *Selaginella*, should also be studied in this connection.

In the following table the results recorded in the present paper are presented in a compact form:—

	Percentage of Ash in Dry Plant.	100 parts of Ash contain	
		Silica.	Alumina.
Lycopodium alpinum	3·68	10·24	33·50
L. clavatum	2·80	6·40	15·24
L. Selago	3·20	2·53	7·29
Selaginella Martensii	11·66	41·03	0·26
Selaginella spinulosa	3·44	6·67	none
Equisetum maximum	20·02	62·95	none
Ophioglossum vulgatum	8·25	5·32	none
Psilotum triquetrum	5·06	3·77	trace (?)

[From the "Chemical News," Sept. 18, 1874.]

CATALOGUE OF HARDY SEMPERVIVUMS.

By J. G. Baker, F.L.S.

During the last few years that hardy Sempervivums have been so much in vogue for decorative purposes, I have often been asked by correspondents to draw up a classified list of the published species, so-called, for use in arranging collections, and showing which of the names used in gardens have really any botanical standing. I have always declined this request, on the ground of want of material for drawing up such a catalogue with a reasonable amount of accuracy. Many of the named forms, of which figures have been published, come so near to one another that I feel quite unable to say to which amongst several of them our garden specimens belong; and on the other hand, several of the older named forms have never been figured, and even when we possess authenticated dried specimens they are of no use, because many of the distinctive characters are lost in the process of drying. However, having this summer made the attempt to draw up a classified catalogue I now send you a copy of it, with the explanation that I only look upon it as a very imperfect performance. It is simply intended to be a catalogue of the names of the forms which have been duly described in botanical books, with a reference to the place where the best description which I know is to be found, and a reference always to any figure that has been published. I do not wish to be understood as guaranteeing that each name represents a distinct form. On the contrary, I believe that when the forms are compared many of these names will, even for garden use, have to stand as synonyms. It would be a useful service if some of your correspondents who have time and opportunity of travelling about to see different collections would take these plants in hand, and work up a monograph. What we want for a beginning is a set of drawings of the forms described in the papers of Lehmann and Schnittspahn and Schott, to be alluded to presently. I do not think it would be a difficult matter to get most of these, if anyone who had a good opportunity would keep the matter in view for a couple of seasons; and these once fully understood, the later named forms would have to be compared with them. No doubt many of the garden forms are hybrids, perpetuated by vegetative reproduction.

Many or most of the names in garden use not included in the following list will, no doubt, be found on comparison to belong to plants already named according to botanical rule, and duly described. For instance, the plant widely spread in gardens as *Sempervivum californicum* (which is an absurd name to give to a species of a genus entirely confined to the Old World) is what Jordan fully described long ago, and has more recently admirably figured under the name of *Sempervivum calcareum*, and of course these published names get dreadfully maltreated and mangled on garden labels. To give one instance only, *Sempervivum arvernense* (which means growing in Auvergne) gets continually changed in the label-writer's hands into *Sempervivum arvense* (which means growing in cornfields). At any rate, my catalogue may help in remedying this evil.

The principal special papers on *Sempervivum*, where a considerable number of forms are fully described or figured, are the following:—1. A monograph of all the known species by Lehmann and Schnittspahn in the *Regensburg Flora* for 1855, beginning p. 1; followed in the volume for 1856, at p. 58, by a list of thirty-six species. This is an excellent paper; but unfortunately there are no figures, and it is in German; but this would be the foundation to build upon for a monograph brought up to the present date. 2. A series of isolated descriptions by Schott, in *Œsterreichisches Botanisches Wochenblatt*, beginning with 1853 and extending over several years: full excellent descriptions in Latin, but here again no figures. 3. *Etudes sur le genre Sempervivum*, by Lamotte, an 8vo pamphlet of 57 pages, published at Clermont-Ferrand, 1864. 4. Descriptions in the second part of Jordan and Fourreau's *Breviarium*, date 1868, pp. 28—46, of thirty-five species, so called, most of which are admirably figured life-size in the *Icones ad Floram Europæ* of the same authors, figs. 198—218. 5. A compendious classified summary of the garden forms in Regel's *Gartenflora*, 1872, pp. 233—238. Copies of all these are accessible in London, and have been used in drawing up the following catalogue.

GENUS SEMPERVIVUM, *Linn.*

SUB-GENUS 1. *Sempervivum proper:* petals and sepals each ten to twelve, spreading; carpels the same number, narrowed suddenly into short stellately divergent styles.

Division 1.—True Sempervivums with red flowers.

1. GROUP OF S. TECTORUM. Leaves glabrous on the surfaces, bordered by a regular fringe of hairs not more than ¼—⅓ line long.

Sub-group 1.—Leaves large, obovate-spathulate, red-tipped, ¾ inch broad.

1. S. tectorum, *Linn.*, as figured Eng. Bot., t. 1320; Curt. Lond., t. 105; Baxter, Brit. Bot., t. 401. (From this the plants called in gardens *calcaratum*, *Royeni*, *rusticanum*, and *Rægnerianum* differ very slightly.)

2. S. Reginæ-Amaliæ, *Held. et Sart.* I do not find any description of this, but it is mentioned in Boissier's Flora Orientalis.

Sub-group 2.—Leaves oblanceolate-spathulate, 1—1½ inch long, ⅜—½ inch broad, green or greenish, with a distinct tip of red brown. (Many of these I am quite unable to separate, even as garden forms.)

3. S. Mettenianum, *Lehm. et Schnitt.*, Flora, 1855, p. 4.

4. S. arvernense, *Lecoq. et Lamotte*, Cat., p. 179; Boreau, Flore du Centre, edit. 3, p. 259; Lamotte, Etudes, p. 24, with description of three varieties, *vellarum*, *lesurinum*, and *pyrenaicum*, of the first of which, *S. Legrandi*, F. Schultz, Flora, No. 30, Oct., 1867, is said to be a synonym *ex parte*.

5. S. alpinum, *Griseb. et Schenck*, Linnæa, 25, p. 600.

6. S. dolomiticum, *Facchini*, Flora, 1854, p. 482.

7. S. Guillemoti, *Lamotte*, Bull. Soc. Bot. France, 1856, vol. iii., p. 457; Etudes, p. 22.

8. S. Boutignyanum, *Billot et Gern.*, Archives Flor. Franc., 1853, 263; Lamotte, Etudes, p. 32.

9. S. Schnittspahni, *Lagger*, Regens. Flora, 1858, 659.

10. S. rubicundum, *Schur.*, Transyl., p. 229.

11. S. modestum, *Jord. et Four.*, Icones, fig. 197.

12. S. robustum, *Jord. et Four.*, Icones, fig. 200.

13. S. saxosum, *Jord. et Four.*, Icones, fig. 207.

14. S. rigidum, *Jord. et Four.*, Icones, fig. 208.

15. S. cantalicum, *Jord. et Four.*, Icones, fig. 209.

16. S. leptopetalum, *Jord. et Four.*, Icones, fig. 210.

17. S. erubescens, *Jord. et Four.*, Icones, fig. 211.

18. S. dicranocladon, *Jord. et Four.*, Icones, fig. 212.

19. S. corymbosum, *Jord. et Four.*, Icones, fig. 213.

20. S. constrictum, *Jord. et Four.*, Icones, fig. 214.

21. S. celsicaule, *Jord. et Four.*, Brev. ii., p. 38.

22. S. collinum, *Jord. et Four.*, Brev. ii., p. 39.

23. S. speciosum, *Lamotte*, Etudes, p. 11.

24. S. brachiatum, *Lamotte*, Etudes, p. 18.

Sub-group 3.—Leaves shaped and coloured as in the last, but appreciably smaller, and flower stems dwarfer.

25. S. parvulum, *Jord. et Four.*, Icones, fig. 204.

26. S. constrictum, *Jord. et Four.*, Brev. ii., p. 43.

Sub-group 4.—Leaves oblanceolate-spathulate, 1—1½ inch long, ⅜—½ inch broad, very glaucous, with a very distinct red-brown tip.

27. S. calcareum, *Jord.* Obs., vii., p. 26; Jord., et Four., Icones, fig. 194; Lamotte, Etudes, p. 34 (*S. californicum*, Hort.)

28. S. racemosum, *Jord. et Four.*, Icones, fig. 195.

29. S. luxurians, *Jord. et Four.*, Icones, fig. 206.

30. S. pyrenaicum, *Jord. et Four.*, Brev. ii., p. 44.

31. S. columnare, *Jord. et Four.*, Icones, fig. 196.

32. S. violascens, *Jord. et Four.*, Brev. ii., p. 34.

33. S. seusanum, *Jord. et Four.*, Brev. ii., p. 35.

34. S. trifurcum, *Jord. et Four.*, Brev. ii., p. 41.

Sub-group 5.—Leaves same size and shape as in the last, glaucous, with an obscure red tip.

35. S. glaucum, *Tenore;* Lehm. et Schnitt., Flora, 1855, p. 3.
36. S. Camollei, *Rotta*, Fl. Berg., 100.
37. S. Schlehani, *Schott*, Œster. Wochen., 1853, p. 12.
38. S. Schottii, *Baker; S. acuminatum*, Schott, Œster. Wochen., 1853, p. 28; but the name had been used before for a Himalayan species by Decaisne, Jacquem. Voyage, tab. 74.
39. S. adoxum, *Jord. et Four.*, Brev. ii., p. 40.

Sub-group 6.—Leaves same size and shape as in the last, but pale green or glaucous, concolorous (not red-tipped).

40. S. decoloratum, *Jord. et Four.*, Icones, fig. 198.
41. S. beugesiacum, *Jord. et Four.*, Icones, fig. 199.
42. S. blandum, *Schott*, Œster. Wochen., 1853, p. 29.
43. S. rhodanicum, *Jord. et Four.*, Icones, fig. 201.
44. S. validum, *Jord. et Four.*, Icones, fig. 203.
45. S. juratense, *Jord. et Four.*, Brev. ii., p. 28; Reuter, Cat. Genev., edit. ii., p. 86.
46. S. præstabile, *Jord. et Four.*, Brev. ii., p. 29.
47. S. sabaudum, *Jord. et Four.*, Brev. ii., p. 29.
48. S. obovatum, *Jord. et Four.*, Brev. ii., p. 32.
49. S. pallidum, *Jord. et Four.*, Brev. ii., p. 33.
50. S. breviramum, *Jord. et Four.*, Brev. ii., p. 36.
51. S. monticolum, *Jord. et Four.*, Brev. ii., p. 37.
52. S. ambiguum, *Lamotte*, Etudes, p. 17.
53. S. Lamottei, *Boreau*, Mem. Soc. Maine et Loire, 1859, p. 86; Lamotte, Etudes, p. 7.
54. S. brevistylum, *Lamotte*, Etudes, p. 10.
55. S. Maitrei, *Lamotte*, Etudes, p. 19.
56. S. compactum, *Lamotte*, Etudes, p. 19.

Sub-group 7.—Dwarfer plants than the last sub-group, with oblanceolate-spathulate leaves, about 1 inch long, 4 lines broad, pale green or glaucous, without a coloured tip.

57. S. Verloti, *Lamotte*, Etudes, p. 21; Jord. et Four., Icones fig. 216.
58. S. venustum, *Jord. et Four.*, Icones, fig. 202.
59. S. pallescens, *Jord. et Four.*, Icones, fig. 215.
60. S. lætevirens, *Jord. et Four.*, Icones, fig. 205.
61. S. modestum, *Jord. et Four.*, Brev. ii., p. 38.

2. GROUP OF S. FIMBRIATUM.—Leaves fringed with longer and closer ciliæ than in the *Tectorum* group, and those of the top variously directed, the hairs sometimes extending a little to the back and face of the leaf.

62. S. fimbriatum, *Lehm. et Schnitt.*, Flora, 1855, p. 16; the Himalayan plant figured under the same name by Klotsch (Reise Wald., t. 43), is a totally different species.
63. S. Funckii, *F. Braun;* Koch, Flora, xv., p. 4; Sturm Deutsch. Flora, xvi., t. 67; Reich. Ic. Crit., t. 967; Jord. et Four., Icones, fig. 218.
64. S. Pomelii, *Lamotte*, Ann. Auverg., p. 27; Etudes, p. 49

(regarded as a hybrid between *arvernense* and *arachnoideum*); *Jord. et Four.*, Icones, fig. 217.

65. S. angustifolium, *Kerner*, Œster. Wochen., 1870, p. 285.

66. S. piliferum, *Jordan*, Obs., vii., p. 27; Lamotte, Etudes, p. 44.

67. S. barbatulum, *Schott*, Œster. Wochen., 1853, p. 91.

68. S. atlanticum, *Ball et Hook. fil.*, Bot. Mag., tab. 6055, as a sub-species of *S. tectorum*.

3. Group of S. montanum.—Leaves puberulent on the face, without any distinct fringe of hairs on the edges, as in the two foregoing groups. Habit mostly dwarf.

69. S. montanum, *Linn.*; Lehm. et Schnitt., Flora, 1855, p. 19; Jacq., Austr. Suppl., t. 41; DC., Plant. Grasses, t. 105.

70. S. monticolum, *Lamotte*, Etudes, p. 52; "*S. montanum*, Linn. et Auct., *ex parte*."

71. S. alpestre, *Lamotte*, Etudes, p. 54.

72. S. frigidum, *Lamotte*, Etudes, p. 56.

73. S. marmoreum, *Griseb.*, Spicel. Rumel. i., p. 329; *S. montanum*, Sibth. et Smith, *non* Linn.

74. S. flagelliforme, *Fisch.*; Lehm. et Schnitt., Flora, 1855, p. 18.

75. S. pumilum, *M. Bieb.*; Boiss., Fl. Orient. ii., p. 796.

76. S. stenopetalum, *Lehm. et Schnitt.*, Flora, 1855, p. 18.

77. S. rupicolum, *Kerner*, Œster. Wochen, 1870, p. 285.

78. S. caucasicum, *Ruprecht*; Boiss., Fl. Orient. ii., p. 796.

79. S. assimile, *Schott.*, Œster. Wochen., 1853, p. 19.

4. Group of S. arachnoideum.—Dwarf plants, with the tops of the central leaves of the rosette united by a web of fine white threads.

80. S. arachnoideum, *Linn.*; DC., Plant. Grasses, t. 106; Jacq., Flor. Aust., t. 42; Bot. Mag., t. 68; Boreau, Flore du Centre, 3 edit., p. 261; Lehm. et Schnitt., Flora, 1855, p. 20.

81. S. Doellianum, *Lehm.*, Flora, xxxiii., p. 449; Lehm. et Schnitt., Flora, 1855, p. 19.

82. S. rubellum, *Timbal-Lagrave*, Bull. Bot. France, v., p. 14; Lamotte, Etudes, p. 46 (as a hybrid between *pyrenacium* and *arachnoideum*).

83. S. tomentosum, *Lehm. et Schnitt.*, Flora, 1856, p. 57; *S. Webbianum*, Hort.

84. S. Fauconnetii, *Reuter*, Cat. Genev., p. 298; Gren., Flore Jurass., p. 280; Godet, Suppl. Jura, p. 88.

85. S. heterotrichum, *Schott*, Œster. Wochen., 1853, p. 83.

Division 2.—True Sempervivums (sepals, petals, and carpels 10—12), *with yellow flowers.*

86. S. Wulfeni, *Hoppe*; Koch, Syn., edit. i., p. 262, edit. ii., p. 289; Sturm, Deutsch. Flora, vi., t. 23; *S. globiferum*, Wulfen in Jacq. Fl. Austr. v., tab. 40, *non* Linn.

87. S. albidum, *Lehm. et Schnitt.*, Flora, 1855, p. 4.

88. S. armonum, *Boiss. et Huet.*, Walp. Ann., vii., p. 923; *S. globiferum*, Boiss., Fl. Orient. ii., p. 797.

89. S. Braunii, *Funck;* Sturm, Deutsch. Flora, 16, t. 67; Koch, Synops., p. 263; Lehm. et Schnitt., Flora, 1855, p. 7.

90. S. grandiflorum, *Haworth;* Lehm. et Schnitt., Flora, 1855, p. 7; *S. globiferum*, Bot. Mag., tab. 2115.

91. S. globiferum, *Linn. ex parte;* Bot. Mag., tab. 507; Koch, Bot. Zeit., xviii., p. 210, tab. i.; Lehm. et Schnitt., Flora, 1855, p. 6.

92. S. ruthenicum, *Koch.*, Synops, edit. 2, p. 289; Lehm. et Schnitt., Flora, 1855, p. 5; *S. arenarium*, Steven, in Herb. Kew. *non* Koch.

93. S. Zellebori, *Schott*, Œster. Wochen., 1857, p. 245.

94. S. Pittoni, *Schott*, Nyman et Kotschy, Analecta, p. 19.

SUB-GENUS 2.—*Jovis-barba*, Koch (*Diopogon*, Jord. et Four.). Sepals, petals, and carpels only six each; the flower yellow; the carpels close to one another from base to apex, narrowed gradually into the long straight styles.

95. S. hirtum, *Linn.*, Sp. Plant., edit. 2, p. 665; Lehm. et Schnitt., Flora, 1852, p. 21; DC. Plant. Grasses, t. 107; *Diopogon Allioni*, Jord. et Four., Icones., fig. 192.

96. S. stramineum, *Baker; Diopogon stramineus*, Jord. et Four., Icones, fig. 193.

97. S. arenarium, *Koch*, Synops., edit. 1, p. 833; Sturm, Deutsch. Flora, xix., t. 83; Lehm. et Schnitt., Flora, 1855, p. 23; Schott, Analecta, p. 19; *S. Kochii*, Facchini.

98. S. hirtellum, *Schott*, Verh. Sieb., Verein, 1857, p. 171.

99. S. Neilrichii, *Schott*, Nym. et Kotschy, Anal., p. 19.

100. S. Heuffellii, *Schott*, Œster. Wochen., 1852, p. 18; *Diopogon Heuffellii*, Jord. et Four., Brev. ii., p. 46; *S. patens*, Griseb. et Schenk, Iter, Hung., p. 215; Boiss., Fl. Orient. ii., p. 797; *S. Brassaii*, Hort. Vindob.

101. S. debile, *Schott*, Œster. Wochen., ii., p. 18.

102. S. Hillebrandtii, *Schott*, Œester. Wochen., ii., p. 18.

103. S. transylvanicum, *Baker; S. ciliatum*, Schur., Fl. Transyl., p. 229, *non* Sims, Bot. Mag., tab. 1978.

104. S. soboliferum, *Sims*, Bot. Mag., tab. 1457; Koch, Syn., edit. 2, p. 290; Lehm. et Schnitt., Flora, 1855, p. 22; *S. globiferum* Linn. *ex parte*; Reich. Ic. Crit., tab. 889; *S. hirtum*, Jacq. Fl. Austr., tab. 12.

[From the *Gardener's Chronicle*, 1874, pp. 103, 104.]

Notices of Books.

Flora Cravoniensis; or, a Flora of the vicinity of Settle, in Craven, in Yorkshire. . . . By JOHN WINDSOR, F.R.C.S., F.L.S., &c., Manchester, 1873. Printed for private circulation (pp. 177).

The author of this little contribution to local botany died on September 1st, 1868, at the good old age of 81. From the preface and body of the Flora, we find that at the beginning of the century, when a boy at Giggleswick school, he investigated the plants in the neighbourhood of his native town, Settle, and was rewarded by numerous discoveries—*Poa alpina*, *Epipactis atrorubens*, *Crepis succisæfolia*, &c.—duly communicated to Sir J. E. Smith and Sowerby and recorded in the "English Flora," and other works of the time. From the year 1815 till his death, the author was in the active practice of the medical profession in Manchester, and paid only occasional visits to his old neighbourhood—the last in 1867; the records in the book before us are therefore chiefly of old date. In his early botanical inquiries his instructors were William Kenyon, a nail-maker, and T. W. Simmonds, a medical man—who afterwards went as naturalist to the W. Indies, where he died in 1804—and his companions John Carr, afterwards head-master of Durham school, and John Howson, afterwards one of the masters of Giggleswick school. In those days the Linnean system reigned supreme in England under Smith, and though in this Flora the author, "in conformity with the more prevailing opinions and customs of the present day," adopted "what is called the natural method," he still entertained for the supplanted system "a sort of filial respect and attachment." Dr. Windsor was, indeed, one of the last of the old school of English botanists, and, except for the adoption of the Natural System, his book is a good example of the best form of the local Floras of thirty or forty years ago.

It consists of a classified catalogue, with the English names and references to the old "English Botany" of the flowering plants, ferns, mosses, and lichens of a district limited (with very few exceptions) to about 15 miles round Settle. The Fungi and Algæ are not included. Under each plant we have the localities (except for the commonest), and it is evident that great care has been taken to insure accuracy in them. A prominent feature indeed of the Flora is the impression it gives of a very trustworthy character. There are some few critical observations; *Hieracium Gibsoni* of Backhouse is considered to be a spotted form of *H. pallidum* (var. *petechiale*); an interesting history is given of the singular confusion which long prevailed between this plant and *Hypochæris maculata*. The author's views on the two forms of *Thlaspi alpestre* have been previously published in the Journal of the Linn. Soc., x., p. 196. In the Cryptogamic portion much information has been afforded by Dr. Carrington and the late Mr. Nowell.*

It should be stated here that the Flora originally appeared as papers in the new series of the "Phytologist," from 1855—1858, which are here reprinted with many corrections and additions. The friends of its lamented author are to be felicitated on the appearance of so fitting a memorial of an estimable English botanist, and those interested in the subject will be glad to possess a useful guide, in a portable form to the botany of a favoured locality. It is to be regretted that the book is not published. H. T.

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* In connection with Settle botany it is perhaps worth while to make a reference here to the pages of Dr. Merrett's *Pinax Rer. Nat. Brit.*, first published in 1666, where will be found a good many localities for plants in the district.

Botanical News.

ARTICLES IN JOURNALS.—SEPTEMBER.

Grevillea.—M. J. Berkeley, "Notices of N. American Fungi" (contd.)—Nylander, Reply to Dr. Weddell's remarks.—J. M. Crombie, "New Species of British Lichens."—J. Stirton, "*Lecidea subretusa*, n.s." (Ben Lawers.)—Id., "New British Lichens."—E. Parfitt, "*Palmodictyon viride*, Kütz., in Devon."—M. C. Cooke, "Carpology of *Peziza*" (tab. 27, 30).—F. Kitton, "Critical Notes on some Diatomaceæ."—W. Archer, "*Cylindrocapsa involuta* in Ireland."

American Naturalist.—W. W. Bailey, "*Azalea viscosa* a fly-catcher."

Flora.—E. Fleischer, "On the Embryology of Dicotyledons and Monocotyledons" (contd.)—W. Nylander, "On Dr. Weddell's remarks in Grevillea."—J. Pfund, "Two Days in Suez" (*Cleome ascher‑soniana*, n.s., *Fagonia Forskalii*, n.s.)

Oesterr. Bot. Zeitschr.—W. O. Focke, "The Distribution of Trees and Shrubs."—K. Mikosch, "On the Occurrence of double Stomata."—J. Kerner, "Flora of Lower Austria" (contd.)—J. C. Schlosser, "The Kalniker Gebirge" (contd.)

Hedwigia.—G. Winter, "Mycological Notes."—P. Magnus, "*Ascomyces Tosquinetii*, West" (with plate).

Bot. Zeitung.—T. Irmisch, "On the Morphology of some species of *Geranium*, especially *G. sanguineum* and *G. tuberosum*" (contd.)—P. Ascherson, "Preliminary report of the botanical result of Dr. Rolf's expedition to explore the Lybian Desert."—F. Hegelmaier, "On the Development of the Monocotyledonous embryo, with remarks on the formation of the seed-cap" (tab. 10, 11).

Botaniska Notiser (Sept. 14).—E. D. Iverus, "*Senecio vulgari-viscosus*, *S. vulgaris* var. *villosus*, and *Galeopsis glandulosus*."—Correspondence.

Bull. Soc. Roy. Bot. Belgique (t. xiv., n. 1. Sept. 15).—B. C. Dumortier, "Jungermannideæ Europæ post semiseculum resensitæ, adjunctis Hepaticis" (tab. 1—4).

Bull. Bot. Soc. France (t. xxi., n. 2).—E. Cosson, "De *Junco* in Gallia recentius observato" (*J. balticus ?*).—Id., "Biography of A. F. Passy."—C. Roumeguère, "Unpublished Correspondence between Alex. v. Humboldt and Aug. Broussonet on the Nat. History of the Canary Is."—Id., "On a monstrous Agaric."—M. Cornu and Roze, "List of parasitic Fungi collected May 8th, 1874, in wood of Meudon."—E. Cosson, "On the Cactoid Euphorbias of Marocco" (*E. Echinus*, Hook., f. & Coss. n.s.)—J. le Segnes, "Note on a monograph of *Fistulina*."—C. Richon, "On a new species of *Dendryphium*" (*D. pulchrum*).—J. Duval-Jouve, "On the presence of a racheole in the utricle of *Carex ædipostyla.*"—E. Heckel, "Anatomical conditions of the induced movements of stamens of *Mahonia* and *Berberis.*" —Id., "Movement of stamens of *Sparmannia*, *Cistus*, and *Helianthemum.*"—E. Fournèier, "On the Andropogons of Mexico."—J. Poisson, "Report of excursion to Sologne."—G. de St. Pierre, "Observations on Lenticels."—C. Romeguère, "Second visit to Jardin d'Experience at Collioure."

Annales des Sc. Nat. (s. 5, t. xx., n. 1 & 2. July).—C. E. Bertrand, "Anatomie comparée des tiges et des feuilles chez les Gnétacées et les Conifères" (tab. 1—6).

New Books.—F. A. Flükiger and D. Hanbury, "Pharmacographia, a history of the principal Drugs of vegetable origin," 8vo. (Macmillan and Co., 18s.)—E. Fries, "Hymenomycetes Europæi sive Epicriseos systematis Mycologici edito altera." (Upsala, 21s.)—P. A. Saccardo, "Mycologiæ Venetæ Specimen." (Padua, 1873, 9s.)—E. Fries, "Icones Selectæ Hymenomycetum," pt. ix.—V. B. Wittrock, "Prodromus Monographiæ Œdogoniearum." (From Acta Reg. Soc. Scient., Upsala, ser. 3, v. ix.)—L. Pfeiffer, "Synonymiæ botanicæ 1870 editæ supplementum primum." (Cassel, 2s.)—B. C. Du Mortier, "Jungermannideæ Europæ." (Brussels and Leipsig.) —J. Windsor, "Flora Cravoniensis." (1873. Not published.)—F. Liebman and J. Lange, "Icones Plantarum sponte nasc. in regnis Sueciæ et Norvegiæ, supplementum operis Floræ Danicæ nomine inscripti." Fasc. iii. (60 plates, completing the 1st vol.)

Exsiccata.—Etienne, Mousses de la Normandie, Fasc. iv.—Saccardo, Mycotheca Veneta, Cent. i. (12s.)

Pringsheim's "Jahrbucher f. wissenschaftliche Botanik" for 1874 contains papers by A. Vogl on the structure of the wood of *Ferreira spectabilis*, and formation of Angelin Pedra resin (with 2 plates), by Hegelmaier on cuticular structures (with 3 plates), by Pfeffer on the phenomena of stimulation in *Mimosa pudica*, and by G. H. Vöchtung on the morphology and anatomy of the *Rhipsalideæ* (with 18 plates).

Mr. J. C. Melliss is preparing a work on S. Helena. It will contain complete lists of the natural productions of the island, and the Flora will be illustrated by numerous coloured plates, including figures of many of the almost extinct arboreous Compositæ.

The Belfast Naturalists' Field Club published an excellent guide to the district, *apropos* of the meeting of the British Association. It contains a good account of the physical geography, geology, natural history, and agriculture. The Botanical section occupies only thirteen pages, and notices the chief plants of interest of Cos. Down and Antrim.

A Flora of Mauritius is in preparation as one of the Colonial series issued from Kew. The editorship will be in the hands of Mr. J. G. Baker. A complete list of the plants of the island, so far as known, has been printed in the Transactions of the Royal Society of Arts and Sciences of Mauritius.

Dr. W. G. Farlow has been appointed assistant Professor of Botany at Cambridge, United States. He is to be attached to the Bussey Foundation at Forest Hills, near Boston, where the Cryptogamic Laboratory is located. Dr. Farlow was the purchaser of the important collections of the late Mr. M. A. Curtis, the well-known cryptogamist of America.

There is a biography of the late Hugo von Mohl in the Leopoldina, heft x., p. 34.

An enumeration of the published works of the late Prof. Fée occupies nearly five closely-printed octavo pages of the last part of the "Bulletin" of the French Botanical Society.

The Caradoc Field Club held a meeting at Church Stretton on October 14th, to investigate the district for Cryptogamic plants. In spite of bad weather a number of specimens were collected. A dinner at the Raven Hotel, Shrewsbury, followed, after which the Rev. W. A. Leighton gave an address on the structure, growth, and mode of reproduction of Lichens, illustrated by specimens from his own herbarium; and the Rev. J. E. Vize exhibited numerous microscopic specimens of spores of Fungi, &c. A collection of the larger Fungi attracted much attention. The meeting was in all respects very satisfactory.

A Fungus show has been held at Munich, in the Crystal Palace there, from October 3rd to 11th, and is said to have been visited by nearly 50,000 persons. The arrangements were well made and the plants carefully labelled. A list of the species exhibited will be found in the "Gardener's Chronicle."

The Cryptogamic Herbarium of Mr. I. Carroll of Cork, which is very rich in Irish Lichens, and contains many of the late Admiral Jones's specimens, has been acquired by the British Museum.

In the 25th volume of the "Transactions of the Royal Irish Academy," Dr. McNab details the results of his experiments on the movements of water in plants. We hope to give an account of these at some future time, but take the opportunity here of quoting a part of Dr. McNab's prefatory remarks:—"The chief difficulty I have had to contend with has been the impossibility of obtaining in Dublin, in the same locality, the two essentials for experimenting—namely, a laboratory and a botanical garden. The appliances of a chemical laboratory must be within easy reach of the plants to be experimented on. . . As it was impossible to obtain in Dublin the necessary laboratory appliances in or near to a botanical garden, I was compelled to seek for a place to experiment in which they could be thus obtained. I here take the liberty of suggesting that some steps might be taken to obtain the necessary laboratory accommodation in the botanical garden in this city." We hope the suggestion will be acted upon, as it deserves to be; as it is greatly to be regretted that where the will and the necessary ability exist, good work should be hindered or prevented by the want of the necessary appliances.

Original Articles.

NEW SPECIES OF THE GENUS *ASCOBOLUS*.

By James Renny.

(Plates 153—156.*)

In M. Boudier's well-laboured and elegant monograph† of the genus *Ascobolus*, or rather the genera which he collects together in his family *Ascobolei*, he objects to associate with these genera any Pezizæ-form fungus which does not embody three characteristics—prominence of ascus, dehiscence of the ascus by an operculum, and absence of nucleus or granulation in the spores. Many of the other *Helvellacei* have one or two of these characters, but in the *Ascobolei* alone, according to M. Boudier's definition of the group, are the whole three united. This definition consequently compels him to exclude from his lists of species a minute cup-shaped fungus with aspect and habit remarkably similar to the prominent species of his genus *Ryparobius*, and like them endowed with many-spored asci. He relegates this plant, which he fully describes under the name of *Peziza cunicularia*, to the vast genus *Peziza*. He concludes his description, however, by saying that he does not doubt it will constitute a new genus, along with the plant described by the MM. Crouan, when these *Discomycetes* shall have been more thoroughly studied. M. Crouan's fungus is presumedly the same as M. Boudier's,or a sister form, and, as well as a similar growth found by M. Leveillé, accords with the verbal description given by M. Boudier of his *Peziza cunicularia*.

I have found many specimens of this minute and interesting growth within the last few years. My principal gatherings have been made in Herefordshire, but I have rarely failed to find it whenever or wherever I have looked for it in a suitable locality. I have met with many varieties. Some differ but little from a normal form, others present variations of sufficient importance to constitute in my view specific distinctions, although all my plants will bear out the characters given by M. Boudier with but trifling alterations. As these salient varieties now number at least six, the time has perhaps arrived, foreshadowed by M. Boudier, when a new genus or a new section may be formed to contain them.

Has then this small group of *Discomycetes* strong affinities either to *Peziza* or *Ascobolus*, in which case it would be well to make them a section of one of these genera, or are they, as M. Boudier holds, so distinct (from *Ascobolus* at least) as to require for their nomenclature the proposal of a new genus? Mr. Cooke, it may be remarked, in his "Handbook of British Fungi," follows only partially M. Boudier's plan. As I understand M. Boudier, he makes use of five generic names, and not of five sections of the genus *Ascobolus*. Such a division of this genus, in sections under M. Boudier's generic names (omitting *Ryparobius* and *Theothecus* not then found in England), Mr. Cooke adopts, and he precedes it with Mr. Berkeley's old definition of *Ascobolus*, in which "asci exploded," is the important character. I presume, therefore, that he found M. Boudier's arrangement unmanageable, if not based upon artificial rather than natural distinctions.

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* We are greatly indebted to the Woolhope Club, Hereford, for permission to use these plates and the accompanying text which were prepared for the new volume of their Transactions.—[*Ed. Journ. Bot.*]

† Ann. des Sc. Nat. ser. 5, tom. x., p. 191. (See also Journ. Bot., 1870, p. 40.)

The marked characteristic of the funguses it is my object to describe, is the possession of a strongly-defined ring near the summit of the ascus, formed at an early stage of life by a thickening within of the external wall. This ring is in no way connected with the subsequent dehiscence of the ascus. It does not contract, or dry up, or split so as to constitute the portion of the ascus above it a large operculum. It rather acts at last in opposition to such a manner of rending. Dehiscence takes place transversely to the plane of this ring, and forms a bilabiate opening above it and down to it. For this reason M. Boudier excludes from his *Ascoboli* a growth which in all other respects, by aspect, by contour, by habitat, by growth, and by enumeration of parts, is one with the leading forms of *Ryparobius*, and in my view can hardly be separated far from them without neglecting the principles of natural arrangement. I prefer, therefore, to think of the plants I describe rather as a section of *Ascobolus*, which I would mainly found upon "exploding asci," than as constituting with reason a new genus. The ripe asci are in general strongly prominent, as much so as in *Saccobolus* and *Ascophanus*. I have often found empty cups by no means in a condition of extreme decay, which seemed to me only to be accounted for by a power of ejecting asci. I do not think it would be advisable to admit into *Peziza* or *Helotium*, which have only an eight-spored ascus, species having multisporous asci. I propose then to form a sixth section of *Ascobolus* under the title of *Ascozonus*.

The formation of the zonal stripe upon the ascus of these *Ascoboli*, which distinguishes them so definitely from the members of all other sections, can be well made out. I have been able in more than one of my species to trace its creation quite satisfactorily. In the earliest condition of the ascus, up to about half growth, the contents are nearly uniform, or present only faint spherical outlines of various sizes sparsely and irregularly placed within the uniformly thin walls. At this time the contents begin to differentiate. Large globular granulations collect along and about the axis of the ascus, surrounded by a homogeneous stratum which extends to the general wall. This central granular mass pushes out near its tip horizontally a lens-shaped extension till it touches the wall near the widest part. Here for a while it seems to solder to the wall, spreading slightly above and below the first fine circular line of contact. At this line a thickening now takes place upon the wall, and is soon seen to have a semicircular section projecting inwards. The central globules now contract, the lentiform portion quits the wall, and leaves the thickened line as a ring. They soon redissolve, and the tolerably uniform mass presently begins to differentiate anew into spores, which enlarge, thicken in substance, acquire a visible epispore, and float in a thin liquid. In several species they gradually aggregate into a compact ovate mass, rising towards the upper part of the ascus. Meanwhile the outermost homogeneous stratum thins away till the ascus is seen to be filled only with a fluid in which the aggregated spores are floating. I am not aware of any physiological reason for the lentiform protraction, which thus causes the zonal thickening, but it has been more or less completely observed in every species described. The figures have been drawn from *A. Woolhopensis* in which the changes are well marked.

The plants are for the most part exceedingly small, rarely exceeding $\frac{1}{50}$ in diameter. They have usually a silvery whiteness and purity very attractive under the microscope. The number of spores within an ascus is generally 64, but the difficulty of counting them is great and rarely allows the exact number to be made out. Thirty-two are less frequently met with. They vary, however, from 16 to 128 or more. The spore-number seems constant in the same species, and thus constitutes a good specific quality. The walls of the cup are usually thick, that is, comyosed of several layers of cells. In one species, however, the cup is formed of a single stratum. The cells vary much in size; in *A. Woolhopensis* being very large and bladdery. The fringe of hairs on the margin of the cups varies in length and in evenneess. The Asci are usually curved and never cylindrical. They dehisce, as I have said, by a rent which commences at the tip extending straight down on two sides to the ring. The two valves thus formed are usually well parted. Paraphyses are very rarely met with. asci seem to be exploded very frequently, if not as a rule. The older the cups the fewer asci are to be met with, and cups entirely empty and but slightly discoloured are often seen.

The *Ascozoni* are found on the dung of rabbits and hares, birds and mice. At most seasons of the year they may be met with but chiefly in winter. That this season should exhibit them in greater abundance is probably to be ascribed to the greater dampness then prevalent, which allows of growth uninterrupted by drought.

ASCOBOLUS, *Pers.*, § ASCOZONUS, *Renny*. (sect. nova.)

Cupulæ minutissimæ, lucenter hyalinæ, hemisphericæ et sessiles, aut subconicæ et stipitatæ, glabræ aut in una specie subhirtæ, ad marginem pilis plerumque uniseriatis coronatæ, stercoricolæ. Discus planus aut convexus, ascis prominentibus papillatus. Asci ampli, curvati, clavati aut oblongo-ovati, sporas 16 ad 128 aut etiam plures includentes, annulo subcrasso conspicuo versum apicem cincti, fissura verticali bilabiata dehiscentes. Paraphyses innumerosæ, interdum furcatæ. Sporæ numerosæ, oblongo-fusiformes, intus egranulosæ, episporio hyalino glabro inclusæ, ad maturitatem asci extremitatem versus in massam ovatam imbricatam plerumque aggregatæ.

A. CUNICULARIUS, *Renny*. *Peziza cunicularia*, Boudier, Ann. des Sc. Nat. v. Sér., tom. x., p. 258. *Ascobolus Leveillei*, Crouan, Flore de Fin., p. 57, suppl. f. 1 (in parte). *Ryparobius argenteus*, B. & Br., Ann. Nat. Hist. iv. Ser., vol. xi. p. 347.

Minutissimus, sessilis, glaber, argenteus, pilis uniseriatis æqualibus mollibus ciliatus; cellulæ exteriores cupulæ nec bullatæ, pæne plane; sporæ 64.

Cups $\frac{1}{80}$—$\frac{1}{100}$ in. wide adhering to a few fine filaments, sessile, smooth, of a silvery whiteness, bearing a single even row of subcylindric smooth hairs not septate but cellulose about $\frac{1}{3}$ of the total height. Asci curved, not so broad as in some other species. Paraphyses few, rather enlarged towards the tip: Mr. Berkeley found them forked. Spores 64. Towards maturity the originally hemispherical cups flatten not inconsiderably. [Tab. 155, fig. 1-4.]

A. Woolhopensis, *Renny*. *Ryparobius Woolhopensis*, B. & Br., Ann. Nat. Hist., iv. ser., vol. xi., p. 347. Minutus, primum candidus dein albidus; cupulæ basi substipitiformæ incrassatæ, inferne tuberculatæ, sursum pilis mollibus partim biseriatis coronatæ; sporæ 64.

Cups 1-40 and 1-60th in. wide and high. Spores normally 64 fusiform ·0007 × ·0003. Minute, scattered, at first white, then dingy with a thick stem-like base which is studded with large uneven semiglobular wart-like cells fringed with unequal close-set or over-lapping hairs which seem here and there to form a double row arising from the much smaller rounded even cells which form the margin.

On birds' dung. Winter. Hereford. [Tab. 153.]

A. Leveillei, *Renny*. Minutissimus, stipitatus, clare albus. Stipes de cellulis bullatis formatus, cupulam obconicam cellulis externe subplanis conditam inferens; asci ampli prominentes bene annulati; sporæ 64 ad 96, oblongo-fusiformes, in massam imbricatam ad asci extremitatem aggregatæ.

Very minute $\frac{1}{80}$—$\frac{1}{10}$ in. wide and high, stipitate, silvery white. Stem formed of rounded prominent cells, the body of the cup of smaller much flattened cells. Marginal hairs in a thin single row short and irregular. Disc rough with the promiment asci which are very broad, tapering below, with strongly marked rings. The spores are more numerous than in *A. Woolhopensis*, amounting probably to 96, and their collected mass is more compact and imbricate. The finer proportions and the thinness of the row of hairs seem also to distinguish it from that species, while the spore number distinguishes it from *A. parvisporus*.

On rabbits' dung. Winter. Hereford. [Tab. 154, fig. 1-5.]

A. Crouani, *Renny*.—Minutissimus, primum candidus dein albidus, fragilis, sessilis, hemisphericus, glaber, substantia laterum strato cellularum unico formata, ad marginem pilis uniseriatis curtis asperellis subacuminatis ciliatus; sporæ 32.

Cups $\frac{1}{180}$ rarely $\frac{1}{100}$ in., formed of a single layer of subcubical cells, with a single row of sharp, pointed hairs often roughened on their sides about one-sixth to one-eighth of the whole height. Disc plane, granulate. Asci narrower than usual. Spores normally 32, oblongo-fusiform. To be distinguished from *A. cunicularius* by the shorter and tapering rough cilia as well as by the thinness and transparency of the walls.

On rabbits' dung. Autumn. Hereford. [Tab. 154, fig. 6-10.]

A parvisporus, *Renny*.—Minutissimus, fragilis, sed carnosior quam alteris-primum totus albus, dein subvinose tinctus, subcylindricus aut obconicus, externe bullatus et interdum celluloso-penicelliatus, pilis inæqualibus asperellis ad marginem ciliatus. Sporæ regulatim 16, interdum plures usque ad 24?, fusiformes, sed nec tam oblongæ quam in alteris speciebus.

Very minute, though fragile somewhat more fleshy than other species. White and brilliant at first, then duller with a faintly vinous tinge. Substance formed of bladdery polygonal cells, unequal in size and often projecting in hair-like-threads, such as are frequently seen in *Peziza granulata*. Margin unevenly fringed with somewhat roughened subulate hairs, often in a partly-double row. Disc flat at first, then filled with the prominent broad slightly clavate 16-spored asci. Spores normally 16? More have been found, but the number is very inconstant; probably 24 is nearly as frequent as 16. They are not closely aggregated or regularly imbricated in the upper part of the ascus.

On rabbits' dung. Autumn. Hereford. [Tab. 156, fig. 1-5.*]

A. SUBHIRTUS, *Renny*.—Minutus, clare hyalinus sessilis hemisphericus pilis curtis inæqualibus 2 vel 3 connatis huc et illuc subhirtus corona pilorum curtorum inæqualium ad marginem investitus. Sporæ 128? nec minus.

Minute, but larger than most species; $\frac{1}{40}$—$\frac{1}{50}$ in., pure white, nearly transparent, sessile hemispherical, dotted with short unequal hairs, mostly connate in pairs or threes besides the unevenly ciliated margin. Disc flat, coarsely papillate. Asci very wide (·0035 × ·0015) subovate, somewhat constricted at the strongly-marked ring which is near the flattened tip. Spores very numerous, not less than 128, collected finally into a dense, regularly imbricated, ovoid mass in the upper part of the ascus.

On rabbits' dung. Autumn. Hereford. [Tab. 155, fig. 4-7.]

ON *TRITICUM PUNGENS*, Koch.

By the Hon. J. Leicester Warren.

On any portion of the English coast which the writer has of late years visited, there has grown a set of sea couch-grasses, catching the eye at once and forming no inconsiderable factor of the shingle or sand vegetation. In old days and in the old herbaria these *Tritica* passed muster for "*junceum*," or "*repens*," according to the taste of the individual collector; at the present time most botanists gather one example wherever they happen to be, put it in their box, and, having thus appeased their critical consciences, think no more of it; but pass on to more inviting sea-side rarities, such as *Frankenia* or *Inula crithmoides*.

Now, if chance has taken the collector across hard glareal flats of caked salt mud and shingle the chances are that he will "box"

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* The engraver has omitted to mark the ascus with its inseparable ring.

Triticum pungens, Koch. If his day lies among shifting sandy banks and dunes, along slopes of light poor littoral pasture, our expectation is that he will gather *Triticum acutum*, DC. For, as a rule, the latter grows on a soft slope, the former on a hard flat; and doubtless the more erect habit of *pungens* and the more procumbent growth of *acutum*, either leads each plant to select such habitats respectively, or is the result of each sub-species having grown for many generations under such a difference of physical conditions.*

Another point: *T. pungens* is a more densely gregarious plant than its congener. If you can see ahead an actual waving corn-field (as it were) of sea-*Triticum*, it will certainly prove *T. pungens*. *T. acutum* is gregarious also after its fashion, but it likes sufficient elbow-room for its stalks, and its individuals are sprinkled about, over large tracts often, at regular intervals of a few inches, but never as close as a crop of grain. For, growing as it does with its head closer to the ground, and with a spike, too, which presents a much narrower and more narrowly distributed surface of resistance to the wind than *pungens*, its individuals are not so top-heavy in a breeze, and do not *wave* at a distance in the same way. When you have come up to the grass and gathered it, a good rough and ready field-test for knowing the two allies apart, is to ask yourself the question, whether the specimen in your hand most resembles in the arrangement of its spike an ear of wheat or a head of the common inland "couch," its cousin-german. Be the spike wheat-like—guess *pungens*: be it like *Triticum repens*—say with fair confidence *acutum*. Translate this difference, if you please, into terms more scientific, and you will find that the compact spike of *pungens* takes up relatively a much shorter portion of the stem than does the lax spike of *acutum* and that the glumes embrace their contained spikelets much higher up in *acutum* than is the case in its ally. *Acutum* has leaves of thinner texture than *pungens*, and shallower ribs upon their upper surface. Over these ribs *small* asperities appear, *not in lines*, and as if sown broadcast. In *pungens* the leaf-ribs bear one or two rows of *larger* asperities declining *in lines* towards the apex of the leaf.†

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* There are, of course, exceptions; indeed *acutum* has been gathered in the interstices of a sea-wall, but then there was a shifting bank of sand, both above and below it. Again, a bed of old musell-shells supplied some excellent specimens, &c. But, with a fair percentage of allowance, I think the difference holds good; lower down I illustrate my meaning by selecting, to illustrate the *kind* of place these two grasses select, the littoral section of *Sclerochloa* as often growing with *pungens*, and *Ammophila* as often growing with *acutum*.

† Those who wish to study Triticum under its "caractères anatomiques" should at once consult the admirable papers of M. Duval-Jouve, whose chief monograph on *Agropyrum* is contained in Vol. vii. of the "Mémoires de l'Académie de Montpellier." It would be beyond the scope of this paper, intended mainly to guide the field-botanist, if we attempted to follow him into characters which lie beyond the reach of a collector's lens of fair power; though doubtless the botany of the future will become more and more microscopic. English botanists, with Dr. Syme and Prof. Babington at their head, *look down* upon a *Triticum* leaf, and draw characters from the co-ordination of asperities along its surface. M. Duval-Jouve disregards such characters (and in many specimens they certainly fail us); he observes *two sizes of ribs* which in both subspecies alternate with fair regularity; and his plates present us with vertical sections of the leaves of the leading sub-species in this group, beautifully executed and

Quitting technicalities and passing to the distribution, as yet very imperfectly known, of these two grasses in Britain, we may suspect that *T. pungens* is certainly the commoner plant and more widely distributed, at least in England.

Dr. Syme has seen specimens of *pungens* from Devon, Wight, Sussex, Kent, and Essex. I have collected it myself in Hants, (Hayling Island), Essex, Cheshire, and Sussex. I have also Kent specimens from Dr. Trimen. In Cheshire I have not yet seen *acutum*. In Sussex it grows in great profusion along the whole coast (except where built upon) from Brighton westward to two miles beyond Worthing; in fact, as far as I have followed the coast-line. At Littlehampton where dunes of shifting sand diversify and occupy the coast, here, in the head-quarters of its ally, *pungens* becomes comparatively rare. On the Cheshire coast, which north of Parkgate more resembles the seaboard at Littlehampton than at Brighton, it is nowhere in great profusion. I should name *Sclerochloa maritima* as its most frequent associate.

Dr. Syme appears to regard *acutum* as the more widely-distributed plant of the two, and gives no detailed distribution, perhaps from its extending farther north into Scotland. But he has not seen specimens from north of St. Andrews, Fife, and Cumberland. I have seen freshly-gathered specimens from Lancashire, and others from Kent (Dr. Trimen), and I have gathered the plant in Hants and Sussex. At Littlehampton on both sides of the river it may be studied to great perfection. It occupies much the sort of shifting bank and sandhill which suits *Ammophila*, which may be taken as its common companion. I never saw *Ammophila* between Brighton and Worthing.

Taken as an aggregate these two sea-grasses constitute a single good species, possibly two good ones.* I cannot combine them as triplets of subspecies either with *T. repens*, as Dr. Syme does, or with *T. junceum*, as Dr. Hooker does. They seem best placed as a couplet of sub-species, with, say, some super specific name like *Triticum littorale*, to embrace both, and read in our native lists *T. repens*, *littorale*, *junceum*. The leaf-texture and armature keep *repens* specifically apart from *pungens* and *acutum*. The organic difference implied by the high fragility of the internodes in *junceum*, forbids any "lumping" in that direction. Its larger, fewer spikelets, narrower, more involute and densely hairy (though ultimately glabrous) leaves, supply besides good secondary characters.

Description of *Triticum pungens*, Koch., as a sub-species.—Root-stock far-creeping, but penetrating to no great depth, producing rather close tufts of barren and flowering stems. Stems growing many together, though hardly cæspitose, very erect, strongly genicu-

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highly magnified. We realise very forcibly by these "side views" the much greater prominence of ribbing which *acutum*, *littorale* (*pungens?*) and *junceum* present as contrasted with *repens* and *caninum*, though a finger touch makes this evident enough. *Junceum* appears in section thickly covered with long spreading hairs, which, however, the essay says soon fall off.

* I suppose Prof. Babington's var. *littoreum* of *T. repens* (omitted in the seventh edition of the Manual) may be held to fall under *pungens* somewhere.

late, solid above, hollow in the lower internodes. Leaves rigid, erect, leathery, rough, glaucous, flat at their base and gradually more involute towards their ultimately pungent apex, faintly streaked and nearly smooth beneath, above furrowed into many sub-equal thick, deep, parallel ribs, each bearing one or two regular rows of asperities, which decline towards the apex of the leaf; upper side of leaf glabrous or very slightly hairy. Spike rigid, stiff, short, compact. Rachis rough not arching or brittle. Spikelets (7-25) rather obliquely set, compressed oval, 5-to 13-flowered, the basal one or two often a little removed from the rest of the spike, but the rest much longer than the internodes. Glumes subequal, lanceolate, or ovate-lanceolate, half the length of the average spikelet, with membranous ciliate margins, distinct ribbing, the midrib often spinous for half its length, obtuse with a short apiculus, or mucronate, or acuminate, or strongly awned. Pales lanceolate, ribbed, and strongly keeled, awned, or acuminate, or mucronate, or obtuse with a minute apiculus. Axis of the spikelets, mealy throughout, but more so on that side of each internode which lies under the lower pale of the spikelet above it.

Var. a. *aristatum.*—Glumes tapering, subulate, awned, hardly (without the awn) half the length of the spikelet. Pales acute, awned, tipped (like the glumes) with a long stiff bristle or arista, longer usually than that of the glume, its midrib scabrous and margins ciliate. Spikelets 6-9 flowered, about 11-14 on each spike, spikelets larger and less compressed than in var. *b.* much less so than in var. *c.* The uppermost sheath covering rather more than half the stem.

Local? Near the farm at New Salts, Shoreham, just across the Norfolk suspension bridge.

Var. b. *mucronatum.*—Glumes lanceolate acute, mucronate, about half the length of the spikelets, less prominently ribbed than in var. *a.*, and hardly scabrous on their keel. Pales tapering, mucronate, furnished, in a more marked degree than the glumes with a short, thick, rather abruptly-pointed mucro. Spikelets 7-9 flowered, about 11-13 to the spike, less compressed and less divergent from the rachis and larger than in var. *c.* Spike shorter, densely and less symmetrically arranged than in the other vars., the midway spikelets of the spike often larger than the upper or lower ones. Uppermost sheaths usually covering a good deal more than half the stem. Leaves very tough, narrow and usually involute nearly throughout.

Probably the commonest form, and to me the type. Essex. Sussex Coast, passim. At the turnpike-bridge over the Arun at old Shoreham. Just north of Parkgate, Cheshire.

Var. c. *pycnanthum*, Gren. & Godr. (Syme E. B.).—Glumes lanceolate obtuse, subapiculate, rather less than half the length of the full-flowered spikelets, with scabrous keels. Pales obtuse, truncate, with a very minute apiculus. Spikelets 6—8 flowered, much compressed, rather divergent from the rachis, about 11—13 to the spike, very symmetrical and of one size throughout the spike, smaller than in the two previous vars. Spike shorter than in the other vars., neat, dense. A greater portion of the stem left bare above the uppermost sheath than in the other vars. The leaves (especially the lower) flatter, less involute, and thinner than in the other vars.

General in Sussex, though likely local elsewhere. Portslade, &c.

I refer these specimens to *pycnanthum* of Grenier & Godron, on Dr. Syme's authority.

Var. d. *distichum.*—Glumes lanceolate-apiculate, more than half the length of the spikelets, and rather less than two-thirds. Keels faintly scarious near their apex. Pales lanceolate truncate, apiculate (apiculus rather longer than in var. *c.*). Spikelets linear-elliptical, narrower than in the other vars., less compressed, 6-7 flowered, and much more numerous, 21—25 to each spike, curving markedly outwards from the slightly curved rachis in a rather remarkable distichous arrangement. Spike curving (not rigid) and much longer than the previous vars. (3½ to 4 inches long as compared with var. *c*, 2½ to 3 inches.) Uppermost sheath higher than in var. *c.*, but lower than in *a* and *b*. Leaves rather thin and not so markedly involute as the two first vars.

Rare? Near the Aldrington Gate, Portslade. A remarkable plant, which may prove distinct.

These four varieties, a. *aristatum*, b. *mucronatum*, c. *pycnanthum*, d. *distichum*, are arranged accordingly to their relations to the species *T. acutum*. The var. *distichum*, as the nearest allied, is placed last; the var. *aristatum* as most intense *T. pungens*, first. It must be clearly understood, that I do not claim any more than varietal value for any of the four. Of these *distichum* alone seems in any degree to approach sub-specific distinction. *Pycnanthum* is also a good and well defined form, but doubtless *aristatum* and *mucronatum* will be found to shade off into each other. There is found to exist a curious and close parallelism of variety in *Triticum repens*, *T. pungens*, and *T. acutum*—parallelism which *Lolium* and *Brachypodium* also give indications of continuing. *T. junceum* alone in *Agropyrum* hardly ever varies. The genera of *Rosa* and *Rubus* are full of such curious parallel equivalences of divergence in their various sub-specific groups.

On reference to English Botany (vol. xi., p. 180), it will be seen that while the variety γ *pycnanthum* of Grenier and Godron is retained, I have felt compelled to rename and rearrange the rest of the varietal scope of our sub-species *pungens* for these reasons. *Triticum littorale*, as figured by Host in his *Icones et Descriptiones Graminum Austriacorum* (vol. iv., t. 9) gives on the same plate and under one common name two different plants; one of which is in his text (p. 5.) described as being "spiculis aristatis," the other as "spiculis muticis." Now Reichenbach (*Ic. Flo. Germ. et Helv.* (Ed. Sec.) vol. i., tab. cxxi., fig. 263), only reproduces that part of Host's plate and description which refers to the awned plant; relegating in a note the obtuse-glumed plant to *T. repens* as a variety. Dr. Syme (E. B., vol. xi., p. 180) follows Reichenbach in this narrowing of Host's *Triticum littorale*. But it is evident that the original plant, as published at Vienna in 1809, embraced what we now call *pycnanthum* of Grenier and Godron, as well as the after-restricted *littorale* of Reichenbach; which last in its turn probably included my var. β *mucronatum*. Would it not then have been better to have widened Host's *littorale*, by the inclusion of the afterwards distinguished *T. acutum*, thus making *littorale* the super-species to our set of littoral couch-grasses excepting *junceum*—than narrow its original scope into a mere varietal label in this group, in which last category it does not seem here advisable to use it?

T. littorale, Host., receives with propriety a much wider range in Duval-Jouve's monograph; its "formes les plus saillantes" are gathered up into three vars.

α. *genuinum ut vulgatius*:—Glumes et glumelles obtusiuscules, à peine mucronulées; dans ce groupe rentre un forme amaigrie, a epi pauciflore et subulé.

β. *barbatum*:—Glumes acuminées; glumelles acuminées ou barbues.=*T. pungens*, plur. Auct; an Persoon?

γ. *obliquum*:—Glumes brusquement arrondies et obtuses; glumelles plus ou moins obtusus=*A. pycnanthum*, Godr.

Compare now the three vars. of *T pungens*, Koch., as given in Syme E.B.

α. *genuinum*.—Glumes and pales sub-obtuse, apiculate or very shortly mucronate.

β. *littorale*.—Glumes acuminate. Pales acuminate and mucronate or awned.

γ. *pycnanthum*.—Glumes abruptly rounded and obtuse. Pales obtuse not mucronate but sometimes apiculate, &c.

Now I presume from the exact analogy between these divisions of *pungens*, Koch., in E. B., and of *littorale*, Host., in Duval-Jouve, that Dr. Syme has accepted the latter name, as expanded by the botanist of Montpellier, as a fair equivalent to the connotation of his idea of *Triticum pungens*, Koch.* So far so good; if the extent of either sub-species, though diversely named, be the same, the first given variety, of each author, named alike and described alike, surely ought to tally.

Take first the typical *pungens* of E. B., that is *α. genuinum*, Syme. Reichenbach (t. cxxiii., fig. 266) figures as *acutum* a plant which Dr. Syme selects as a suitable figure of type *pungens*. The plant drawn next to it (fig. 266), and given as *pungens* by Reichenbach, Dr. Syme passes over in silence. Certainly the panicle is drawn much too lax; but, in spite of this, M. Duval-Jouve adopts Reichenbach's *pungens* as his own idea of that name, which, however, only appears in his paper as a synonym; while he refers the plant (fig. 266, Dr. Syme's type) to *T. obtusiusculum*, Lange, which in his Danish Flora has *acutum* interposed between it and *pungens*. I think, therefore, though their descriptions tally, it is more than probable that the *genuinum* of Dr. Syme is not the *genuinum* of M. Duval-Jouve. And, therefore, to adopt that name in this paper might only aggravate a suspected ambiguity. Debarred thus from using two out of three of the varietal names of *pungens* in E. B., an attempt was made to recur to the varietal naming of M. Duval-Jouve as given above. But the misfortune is that these are published as varieties of *T. littorale*, Host., not as varieties of *T. pungens*, Koch., and even assuming a fair equivalence between two names for a grass which produces protean forms, still *littorale* under a French aspect does not seem to agree in its "formes les plus saillantes" with *pungens* under an English view.

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* With this exception, Dr. Syme would apparently, if it turned up in England, place the inland form *T. intermedium*, Host. (=fide Duval-Jouve to *T. campestre*, G. and G.) as a fourth var. γ. under *pungens*. While out of respect for tradition rather than from conviction Duval-Jouve makes *T. intermedium*, Host. a subspecies by itself next to but distinct from *T. littorale*.

Neither could this be expected. Three varieties are arranged afresh in this paper, for which the writer does not attempt to claim finality. A wider experience of this multiform[*] *Triticum* round the whole seaboard of these islands is sure to demonstrate the inadequacy, perhaps the inaccuracy of the varieties here set forth. But this attempt will have fulfilled its purpose, if it incites other botanists to a more perfect study of *Triticum pungens*, Koch.

DESCRIPTION OF NEW SPECIES OF *SCILLEÆ* AND OTHER *LILIACEÆ*.

BY J. G. BAKER, F.L.S.

THE following new species of *Scilleæ* have been discovered, or additional information has come to hand, since the publication of my monograph of the tribe in the 13th volume of the Proceedings of the Linnean Society, page 209. I follow the sequence there adopted and number them so they can be intercalated in their places :—

URGINEA, *Steinh.*

3. *U. micrantha*, Solms. Capsula depresso-globosa profunde acute angulata, 4-4½ lin. lata, seminibus in loculo 2-3 discoideis 2 lin. longis, testa nigrescente, *Senegambia*. Perrottet 784 in Herb. DC!

11* *U.* (*Sypharissa*) *mascarenensis*, Baker, n. sp. Bulbus ovoideus 1 poll. crassus tunicis membranaceis griseis. Folia 4 hysteranthia post scapum producta filiformia (immatura solum vidi). Scapi 1-2 graciles stricti 4-6 pollicares. Racemus 1-2 poll. longus laxe 5-10-florus. Bracteæ minutæ rhomboideæ, calcare conspicuo lamina æquilongo præditæ. Pedicelli ascendentes 2-3 lin. longi. Perianthium campanulatum 2½ lin. longum, segmentis oblongis obtusis diutine imbricatis albis dorso rubro-brunneo carinatis. Genitalia perianthio duplo breviora. Antheræ oblongæ, filamentis subulatis duplo brevioribus. Ovarium globosum stylo 1 lin. longo. *Madagascar*, Bojer and Hilsenberg in Herb. Mus. Brit.!

13* *U.* (*Sypharissa*) *Hesperia*, Webb et Bert. Phyt. Can. III. 339. Folia post scapum ignota. Scapus 2-3-pedalis. Racemi elongati densi, pedicellis ascendentibus perianthio longioribus. Bracteæ oblongæ cuspidatæ pedicellis triplo breviores. Perianthium 6 lin. longum, segmentis oblongo-lanceolatis rubellis dorso fusco-vittatis, margine vix scariosis. Stamina perianthio æquilonga antheris oblongo-sagittatis, filamentis basi dilutatis. Stylus demum exsertus. *In Teneriffæ littoribus*. Differs from *anthericoides* by its more robust habit, longer pedicels, and firmer reddish flowers.

18. *U. indica*, Kunth. *Senegambia*, Perrottet 792—793, in herb., DC. !

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[*] M. Duval-Jouve, though he professes to see system in all this chaos, says that the plants of *T. littorale* are so multiform even in one locality, that it is not easy to gather two tufts exactly alike. He propounds a curious theory, that it is the act of maturing their seed which restrains annual grasses within bounds of specific propriety. Such "runagates" as the subject of this memoir, which always creeps and never seeds, transgress into the strangest of varietal vagaries,

22.* *U.* (*Albucopsis*) *angolensis*, Baker. n. sp. Folia synanthia glabra carnosa linearia acuminata sesquipedalia densum 5-6 lin. lata. Scapus fragilis 2-3 pedalis. Racemus densus 5-6 pollicaris, expansus 12-15 lin. latus. Pedicelli erecto-patentes, infimi fructiferi 6-8 lin. longi. Bracteæ lineari-subulatæ persistentes pedicellis subæquilongæ, basi nullo modo calcaratæ. Perianthium membranaceum flavido-viridulum 4½-5 lin. longum, segmentis oblongis obtusis, exterioribus dorso nervis 5-6 segregatis, interioribus dorso nervis tribus crebris præditis. Filamenta lineari-subulata, segmentis paulo breviora. Capsula sessilis 5-6 lin. longa, 8-9 lin. lata, profunde obtuse trilobata, seminibus in loculo 12-20 magnis discoideis. *Angola, in ditione Ambriz in sylvis*, Monteiro ! (Herb. Kew).

24.* *U.* (*Albucopsis*) *brevipes*, Baker, n. sp. Folia ignota, verisimiliter hysteranthia. Scapus sesquipedalis. Racemus laxus semipedalis. Pedicelli ascendentes, floriferi 1-1½ lin., fructiferi 2-3 lin., longi. Bracteæ lanceolatæ acuminatæ 3-4 lin. longæ. Perianthium 5-6 lin. longum albo-flavidum membranaceum segmentis dorso nervis 3-4 brunneis congestis vittatis. Stamina perianthio paulo breviora, antheris oblongis flavis filamentis albis subulatis 5-6—plo brevioribus. Stylus filiformis 4 lin. longus, ovario duplo superans. Capsula ovoideo-globosa 7-8 lin. longa, seminibus in loculo 12-15 perfecte discoideis. *Senegambia*, Perrottet, 782, in herb. DC. !

DRIMIOPSIS, *Lindl.*

3. *D. botryoides*, Baker. Bulbus globosus 1½ poll. crassus, membranaceo-tunicatus. Folia 7-8 synanthia crassa carnoso-herbacea, oblonga acuta 9-12 poll. longa, facie pallide viridia maculis saturatioribus adspersa, dorso immaculata, basi in petiolum latum canaliculatum folio duplo breviorem cuneatim angustata. Scapus teres 12-15 pollicaris. Racemus densus subspicatus 3-4 poll. longus, 6-8 lin. crassus floribus supremis minutis neutris. Pedicelli brevissimi patentes. Bracteæ obsoletæ. Perianthium 3 lin. longum, oblongo-triquetrum, albido-viridulum, segmentis exterioribus ligulatis facie canaliculatis apice cucullatis, interioribus latioribus diutine conniventibus. Stamina segmentis duplo breviora, filamentis lanceolatis, antheris minutis oblongis. Stylus filiformis, ovario brevior. Of this at the date of my paper only two poor dried specimens, not localised, were known. It has now been received from the island of Zanzibar, from Dr. Kirk, and cultivated at Kew, and it is from his living specimens that the present description was taken.

SCILLA, *Linn.*

4. *S. autumnalis*, L. *S. gallica*, Todaro Nuov. Gior. Ital. V. 157, appears to be a slight variety.

20. *S. amœna*, L., var. *S. bithynica*, Boiss. Taurus range, *Aucher Eloy*, 1477, in Herb. DC. !

22.* *S. acaulis*, Baker, n. sp. Folia 5-6 synanthia linearia carnoso-herbacea glabra 3-4 poll. longa, 3-4 lin. lata, a basi facie concavo ad apicem sensim angustata. Flores 6-9 in umbellam subsessilem dispositi, pedicellis ascendentibus 9-12 lin. longis, bracteis linearibus pedicellis brevioribus. Perianthium cœruleum 3 lin. longum, segmentis lanceolatis dorso uninervatis. Filamenta lanceolata 2 lin. longa, antheris oblongis cœruleis. Stylus ½ lin. longus, ovula in loculo plura. *Peruvia ad ripas fluminis Rio Cosnipulta*, Whiteley, in Herb. Mus. Brit.! A very interesting novelty, being the first true Scilla found upon the American continent.

38.* *S.* (*Ledebouria*) *saturata*, Baker, n. sp. Bulbus ovoideus 6-9 lin. crassus membranaceo-tunicatus. Folia 3-4 synanthia glabra acuta lanceolata carnoso-herbacea 3-4 poll. longa, medio 3-6 lin. lata, in petiolum latum canaliculatum 1-2 poll. longum sensim attenuata. Scapus gracilis flexuosus 3-4 pollicaris. Racemus densus oblongus 6-12 poll. longus, 6-9 lin. latus, pedicellis cernuis 2-4 lin. longis. Bracteæ minutæ deltoidæ. Perianthium 2 lin. longum saturate purpureum diutine campanulatum. Stamina purpurea segmentis paulo breviora. Stylus ovario superans, haud exsertus. *Caput Bonæ Spei in ditione* "*Orange Free State*," Cooper, 993!

ORNITHOGALUM, *Linn.*

36. *O. biflorum*, var. *chloroleucum* (Kunth). I cannot, from the the description, separate in any way from this the *O. chilense* described by Philippi in the 29th volume of the Linnæa, page 73, said to be frequent in the central provinces of Chili.

37.* *O.* (*Beryllis*) *subulatum*, Baker, Gard. Chron., 1874, 723. *Caput Bonæ Spei, in rupestribus graminosis montis Boschberg, alt.* 4500 *pedes.* MacOwan, 2067! Herb. Kew. Described in the Gardeners' Chronicle from the garden of Mr. Wilson Saunders.

37.* *O.* (*Beryllis*) *calcaratum*, Baker, Gard. Chron., 1874, 723. Also like the last, described from the garden of Mr. Wilson Saunders, who grew it from bulbs sent by Mr. MacOwan. It is a species with very minute flowers and bracts like those of an Urginea, lengthened out at the base into a spur much larger than the blade.

39.* *O.* (*Beryllis*) *aciphyllum*, Baker, n. sp. Bulbum non vidi. Folia 3 (in exemplo viso) synanthia erecta dura persistentia glabra subulata pedalia, superne 1-1½ lin. deorsum circiter basin scapi 3 lin. lata. Scapus firmus teres sesquipedalis. Racemus angustus sublaxus 3-4 pollicaris, 6-8 lin. crassus, pedicellis ascendentibus 2-3 lin. longis, bracteis lanceolatis pedicellis æquilongis. Perianthium campanulatum 3 lin. longum, segmentis albidis oblongis obtusis, dorso late distincte viridi-vittatis. Stamina perianthio duplo breviora, filamentis alternis lanceolatis, et linearibus. Stylus brevissimus. *Caput Bonæ Spei, in ditione Colesberg*, Dr. Shaw!

40* *O.* (*Beryllis*) *tropicale*, Baker, n. sp. Bulbus ovoideus 4-5 lin. crassus. Folia 5-6 synanthia lineari-subulata glabra, 6-7 poll. longa, 1 lin. lata, dorso subteretia facie profunde canaliculata. Racemus biflorus, pedicellis erectis 12-15 lin. longis. Bracteæ lanceolatæ 5-6 lin. longæ. Perianthium album 1 lin. longum, segmentis oblongis obtusis dorso obscure viridi vittitis. Filamenta æqualia linearia segmentis duplo breviora. Stylus ovario superans. *Sierra Leone*, G. Don. Described from a drawing in the Lindley Herbarium at Cambridge.

41.* *O.* (*Beryllis*) *humifusum*, Baker, Gard. Chron., 1874, p. 500. Described from specimens flowered at Kew from Cape bulbs given to the collection by Mr. Wilson Saunders.

49. *O. narbonense*, L. I cannot distinguish from this a plant

from the Ural Mountains in the herbarium of De Candolle, labelled *O. brachystachys*, Fischer.

58.* *O.* (*Osmyne*) *flavovirens*,' Baker, n. sp. Bulbum non vidi. Folia 5-6 synanthia suberecta linearia glabra ad apicem angustata, 12-18 poll. longa, deorsum, 3-4 lin. lata. Scapus 1½-2 pedalis. Racemus 3-4 poll. longus, expansus 9-10 lin. latus, deorsum laxus, sursum subdensus, 20-30 florus. Pedicelli ascendentes, inferiores 2-3 lin. longi. Bracteæ lineares longe acuminatæ 6-9 lin. longæ. Perianthium 4-4½ lin. longum, segmentis oblongis obtusis flavo-viridibus 1½ lin. latis, carina lata saturatiori, venis 4-5 prædita. Stamina perianthio duplo breviora, filamentis æqualibus lineari-lanceolatis. Stylus filiformis, 2 lin. longus ovario æquilongus. *Caput Bonæ Spei, in inundatis prope Somerset East*, MacOwan, 1852!

63.* *O.* (*Cathissa*) *gracile*, Baker, n. sp. Bulbus globosus 3 lin. crassus tunicis membranaceis. Folia 1-3 synanthia erecta linearia glabra 3-6 poll. longa, 1-1½ lin. lata. Scapus gracillimus 6-8 pollicaris. Racemus 1-6-florus confertus. Pedicelli ascendentes infimi 1-2 lin. longi. Bracteæ deltoideæ cuspidatæ 2-3 lin. longæ pedicellos amplectantes. Perianthium albidum 3 lin. longum segmentis lanceolatis obscure vittatis. Filamenta segmentis duplo breviora, alterna leviter applanata. Stylus 1-1½ lin. longus ovario æquilongus. *Caput Bonæ Spei, in clivis graminosis ad fontes fluminis "Bulk rivier,"* MacOwan, 1939!

63.* *O.* (*Cathissa*) *paludosum*, Baker, n. sp. Bulbum non vidi. Folia pauca lanceolata erecta firma glabra 2 poll. longa 1½ lin. lata. Scapus glaber pedalis. Racemus laxus angustus 2-4 poll. longus 12-20 florus. Pedicelli ascendentes 1-3 lin. longi. Bracteæ lanceolatæ albæ 1½-2 lin. longæ. Perianthium album 3 lin. longum, segmentis oblanceolatis obtusis obscure vittatis. Filamenta 2 lin. longa conformia linearia. Stylus ovario brevior. *Caput Bonæ Spei in ditione Queentown in paludosis ad Elandsberg*, Cooper, 219!.

ALBUCA, *Linn.*

4. *A. flaccida*, Jacq. Ic., t. 444, Kunth Enum., iv., 374, Baker, Linn. Journ., 13, 287, ex parte. Bulbus parvus ovoideus tunicis membranaceis apice haud setosis. Folia 4 glabra synanthia linearia acuminata pedalia vel sesquipedalia deorsum 5-6 lin. lata. Scapus teres sesquipedalis. Racemus semipedalis laxissimus deltoideus, pedicellis patulis apice cernuis inferioribus 1½-2 poll. longis. Bracteæ lanceolatæ 1-1½ pollicares. Perianthium 9-12 lin. longum, segmentis flavo-viridibus. Filamenta segmentis interioribus æquilonga, interiora castrata. Stylus prismatico-clavatus, ovario superans. *Caput Bonæ Spei.* As I have united under *A. flaccida* two plants which, upon fuller information, appear to be distinct, I give an amended description.

4* *A. Cooperi*, Baker, n.sp. *A. flaccida*, Baker in Saund. Ref. Bot., 334; Linn. Journ. 13., 287, ex parte non Jacq. Bulbus ovoideus 6-9 lin. crassus, tunicis apice fibris setosis copiosis persistentibus præditis. Folia 3-4 synanthia erecto-falcata linearia acuminata glabra semipedalia deorsum 3-4 lin. lata. Scapus 6-12 pollicaris teres flexuosus. Racemus laxissimus 4-6-pollicaris pedicellis patulis apice cernuis, inferioribus 1-1½ poll. longis. Bracteæ lanceolatæ 4-8 lin.

longæ. Perianthium flavo-viride 8-12 lin. longum. Filamenta segmentis interioribus æquilonga, interiora castrata. Stylus prismatico-clavatus, ovario superans. *Caput Bonæ Spei*, Zeyher, 1714!. Harvey, 812!. Cooper in Hort. Saunders. *Delagoa Bay*, Forbes!

4*. *A. fibrosa*, Baker, Gard. Chron., 1874, 386. *Caput Bonæ Spei in lapidosis prope Somerset East*, MacOwan, 1830!.

6*. *A. polyphylla*, Baker, Gard. Chron., 1874, p. 471. *Caput Bonæ Spei in campis Somerset East*, MacOwan, 1849!. The following are Mr. MacOwan's notes on this interesting novelty:—"Bulb tunicated, producing many offsets between the laminæ. Leaves 5 to 8 linear 16-18 inches long, narrowed gradually from a 5-6 line base to the apex, concave above, convex beneath, quite smooth, deep green, not at all glaucous. Scape subglaucescent, erect, 2-3 lines in diameter, 8-12 inches high, 15-20-flowered in an ultimately elongating loose raceme. Flowering peduncles 1½ inch long, elongating in fruit. Bracts lanceolate attenuate, about half as long as the flowering peduncles, scarcely 2 lines wide, strongly reflexo-patent at the apex, yellowish-green with a pale submembranous margin. Exterior perianth-segments nearly flat, oblong, 2½ lines wide, 8 lines long, broader at the apex, dull olivaceous green, with a green longitudinal band in the centre a line broad. Interior segments about a line shorter, cymbiform towards the blunt callous yellow apex, green-banded, passing into dusky-grey towards the edge. Anthers all fertile, the alternate smaller, upon oblong-linear filaments, those of the larger sharply dilated at the base. Ovary bluntly triquetrous, with a secondary ridge in each re-entering angle. Style triquetro-prismatic with a furrow between the angles which close to the stigmatic surface receive the callous incumbent apex of the non-expanding petals. The growth of this Albuca is peculiar. In a single season one bulb will produce from three to six offsets, some of which flower a month later than the main scape. This process of rapid multiplication results in the formation of a large raised cushion of closely-compacted bulbs. As many as 47 individuals have been counted thus matted together. The long, recurved yellowish bracts are very conspicuous before the inflorescence begins to expand. In cultivation the scape lengthens to 18 inches and the leaves do not wither away in the upper half as is the case with wild examples."

ALBUCA § LEPTOSTYLA (new section).—Stamina exteriora castrata. Stylus filiformis elongatus.

17. *A. (Leptostyla) Shawii*, Baker, n.sp. Bulbus ovoideus 9-12 lin. crassus, tunicis albidis membranaceis apice nullo modo setiferis. Folia 6-12 synanthia filiformia gracillima glabra 4-5 poll. longa ⅓-½ lin. crassa. Scapus firmus teres 6-9 pollicaris. Racemus laxissime 3-9 florus, expansus 3-4 poll. longus, pedicellis erecto-patentibus apice cernuis, inferioribus 1-1½ poll. longis. Bracteæ lanceolatæ cuspidatæ 2-3 lin. longæ. Perianthium 7-8 lin. longum, flavum, segmentis oblongis obtusis late viridi vittatis, interioribus cucullatis. Filamenta 4-5 lin. longa, filiformia, basi deltoidea, alterna ananthera. Stylus filiformis ovario superans, stigmate capitato obscure trilobato. *Caput Bonæ Spei ad ripas fluminis "Vaal river," et in ditione Colesberg*, Dr. Shaw!. *Kaffraria in graminosis ad Kabousie alt.* 3500 *pedes*, Murray, 54!. (Sent by Mr. MacOwan to Herb. Kew.) An interesting

new type, with the slender style of section *Pallastema* and the barren inner stamens of *Eualbuca*.

SCHIZOBASIS, *Baker*.

S. intricata, Baker. *Anthericum* (*Streptanthera*) *intricatum*, Baker, Journ. Bot., 1872, 140. *Asparagus micranthus*, Thunb. Herb., non Lindley. Bulbus primum foliiferus parvus ovoideus, demum major globosus floriferus 12-15 lin. crassus, tunicis albidis membranaceis. Folia 4-10 subulata erecta carnosa glabra 2-3 poll. longa ½ lin. crassa. Scapus firmus gracilis 2-3 pollicaris. Panicula latiora quam longa, 3-4 poll. lata, ramis primariis ternatis singulis bis dichotomiter furcatis, ramulis ultimis corymbosis paucifloris insigniter angulatim flexuosis, pedicellis erecto-patentibus strictis apice rectis vel cernuis 3-6 lin. longis. Perianthium 1½ lin. longum diutine campanulatum, segmentis oblanceolatis obtusis albis dorso viridibus. Stamina inclusa antheris oblongis. *Caput Bonæ Spei*, Thunberg, Zeyher, 4284 !. Burke, 370 !. *In aridissimis solo glareoso-brecciato ad coronam scopulorum tabularium prope Klyn Visch rivier in ditione Somerset, alt.* 3000 *pedes.* MacOwan, 2131 !. This has now been refound by Mr. MacOwan, who has sent an excellent suite of dried specimens, both in the leaf and flower-producing conditions, and also a box of bulbs for cultivation. This full supply of material shows that it is not an *Anthericum*, but a second species of *Schizobasis*.

I add also descriptions of two new gamophyllous *Euliliaceæ* lately received.

8*. *Lachenalia* (*Orchiops*) *trichophylla*, Baker, n.sp. Bulbus globosus 5-6 lin. crassus tunicis membranaceis albidis apice truncatis. Folium solitarium oblongo-spathulatum acutum erectum, basin scapi amplectans, facie et margine pilis nigrescentibus firmulis patulis ½-1 lin. longis subdense vestitum. Scapus 5-6 pollicaris rubellus. Inflorescentia spicata. Bracteæ minutæ lanceolatæ rubellæ. Spica densa 3-pollicaris, floribus inferioribus rubris, centralibus flavis, multis supremis minutis abortivis. Segmenta exteriora ligulata 6-7 lin. longa, interiora 8-9 lin. longa apice spathulata. Ovarium oblongum distincte stipitatum, stylo longo exserto. Filamenta perianthio æquilonga. *Caput Bonæ Spei in ditione Somerset East*, MacOwan, 2197 !.

8*. *Massonia brachypus*, Baker, n.sp. Folia bina ovato-oblonga crassa viridia 5-6 poll. longa medio 3-3½ poll. lata utrinque glabra subtus pallidiora. Corymbus breviter pedunculatus, bracteis exterioribus oblongo-lanceolatis acuminatis 1 poll. longis. Pedicelli 1-1½ lin. longi. Perianthium tubo campanulato 1 lin. longo rubello, segmentis albis lanceolatis erectis 4 lin. longis. Antheræ 2-2½ lin. longæ oblongæ, filamentis brevissimis (½ lin. longis) ad faucem tubi insertis nullo modo connatis. *Caput Bonæ Spei*, Hort. Kew, Feb,, 1874 !. Remarkable for its very short filaments and perianth-tube.

ON A NEW *SYMPLOCOS*.

BY H. F. HANCE, Ph D., ETC.

SYMPLOCOS (HOPEA) DECORA, *sp. nov.*—Frutex 6-10 pedalis, ramulis teretibus sub epidermide albida mox secedente purpurascentibus, foliis valde coriaceis glaberrimis e basi rotundata v. subcordata ovatis v. ovato-ellipticis breviter obtuse acuminatis margine revoluto inconspicue glanduloso-denticulato venis vix perspiciendis 1½-2½ poll. longis 1-1¾ poll. latis petiolo crasso 3-5 lineali suffultis, racemis axillaribus simplicibus erectis a basi floriferis 12-20-floris dimidium folium æquantibus basi bracteis orbicularibus ciliatis subglabris præditis rachi glabra, bracteolis oblongis ciliatis dorso hirsutis, floribus 4-5 lin. longis inferioribus pedicellatis superioribus sensim sessilibus, calycis glaberrimi tubo obconico lineali lobis vix longioribus coloratis orbiculatis obtusissimis v. ovatis acutiusculis, petalis oblongo-rotundatis 3 lin. longis candidis, staminum corollam vix excedentium filamentis ligulatis, ovarii apice glaberrimo. (Exsicc. n. 18417.)

Cultivated in the Public Gardens, Hongkong, where I gathered it in March 1874. Mr. Charles Ford, the energetic and courteous Superintendent, was unable to tell me its origin, but one of the Chinese gardeners asserted that it was brought down from the hills. Unfortunately, it is impossible to place any reliance on the statements of these men, and it seems unlikely so exceedingly showy a shrub should have escaped the notice of our few local botanists. However this may be, it is doubtless an Asiatic species, and with some affinity to *S. obtusa*, Wall., and probably *S. prunifolia*, S. & Z., which I have not seen. *S. japonica*, A.DC. and *S. crassifolia*, Benth. (the latter also unknown to me), differ by their angular branches. I can find no diagnosis at all like it in any books, and it is by far the handsomest species I have seen, its lovely white blossoms being borne so profusely as to attract the attention of the most careless.

SHORT NOTES AND QUERIES.

ZANNICHELLIA WITH SPIRAL FRUITS.—A very singular change in the fruit of *Zannichellia* has lately come under my notice in a specimen (probably *Z. palustris*) in the Kew Herbarium. In place of the slightly-arched carpels with a terminal style typical of the genus, the plant presents circular fruits which may be accurately described as precisely like the coiled shells of a small *Planorbis*. At the opposite side of the attachment is a prominence indicating apparently the origin of the style which is deciduous in every case, and from the base of the carpel to this prominence along one edge the crenations of the wavy crest can be readily traced. On removal of the thin epicarp the helicoid character becomes still more striking, the form of the enclosed body much resembling the green spiral embryo of *Suæda maritima*. In this *Zannichellia* the embryo instead of being thrice folded on itself at an acute angle as usual is perfectly spiral and is enclosed in a similarly spiral thick endocarp (?) of a dense horny, though somewhat brittle consistence and yellow colour. All the fruits, which are abundantly produced, are the same and many appear perfectly matured. The plant (unfortunately unlocalised) was formerly in the herbarium of Sir W. Hooker, who has written against it "est Potamogeton." I am not aware whether or not a similar modification has been previously placed on record; for the sake of reference, if thought worthy of a varietal name, *gyrocarpa* may be employed.—HENRY TRIMEN.

ADDITIONS TO THE LIST OF LAKE LANCASHIRE PLANTS.—The Rev. W. M. Hind, of Pinner, in July 1870, collected the following which are not included in Miss Hodgson's valuable list printed at pp. 268 and 296 of this volume:—*Helianthemum canum*, Dun., Humphrey Head. *Dianthus Armeria*, L., Cart Lane, Grange. *Hypochœris maculata*, L., Humphrey Head. *Hieracium cæsium*, Fr., Humphrey Head. *Melampyrum sylvaticum*, L. *Epipactis latifolia*, All., Blawith. *Scirpus fluitans*, L., Eller How, Lindale. He also met with *Centaurea Jacea*, L., at Cark, and a singular small form of *Cerastium* at Eller How, Lindale, which is scarcely *C. tetrandrum*, and seems to agree with *C. petræum*, Schultz (*C. Lensii*, Sch., var. γ). Dr. Windsor records (*Fl. Cravoniensis*, p. 45). *Hieracium pallidum*, Fr. at Humphrey Head.—HENRY TRIMEN.

EXPERIMENTS ON THE MOVEMENT OF WATER IN PLANTS.—Dr. W. R. McNab, of the Royal College of Science, Ireland, has printed the first part of a paper recording the experiments in vegetable physiology for which he received a grant from the Royal Irish Academy, in vol. xxv. of the Transactions of that body. The experiments deal with the transpiration of water by leaves and the ascent of water in the stem, and the plants selected were Cherry-Laurel, Privet and Elm. The conclusions resulting from them were:—1. That under favourable circumstances a rate of ascent of forty inches per hour can be obtained. 2. That contrary to the generally received opinion, direct experiment has shown that the upward rapid current of water does not cease in the evening. 3. That checking the transpiration for a short time by placing the branch in darkness, does not materially retard the rapid current of water. 4. That the removal of the cortical tissues does not impede the rapid current in the stem; which moves only through the wood (xylem) portion of the fibro-vascular bundles. 5. That a well-marked rapid flow of fluid will take place in a stem after the removal of the leaves. 6. That fluid will rapidly flow downwards as well as upwards in the wood (xylem) portion of the fibro-vascular bundles, as seen in a branch in which lithium solution was applied at the top. 7. That pressure of mercury does not exert any very marked influence on the rapidity of flow, in the one experiment made with a pressure of 110·53 grammes of mercury.

PLANTS AT PENZANCE IN 1874.—Near the end of August last I found growing on the sandy shore near the East Green *Berteroa incana*, DC., *Moricandia arvensis*, L., *Centaurea solstitialis*, L., *Plantago* *arenaria*, L., *Echium plantagineum*, L., *Setaria glauca*, Beauv. Of the *Echium* I also found many plants in a field on the east side of Loscudiack Castle. *Alyssum maritimum*, L., was found on the shore at Marazion. *Ranunculus Lenormandi*, Schultz., occurred in some quantity on a moor near Paul Hill, and also near Trengorainton Cairn, *Cicendia filiformis*, Reich. occurred on the Paul Hill moor, and *Sagina maritima*, Don I found somewhere within the Penzance district. *Scrophularia Scorodonia* L., and *Conium maculatum* L., were plentiful between Newbyn and Mousehole. *Spiranthes autumnalis*, Rich., grew on the grass slopes near Marazion Road Station.—R. TUCKER. [Mr. Tucker has kindly submitted his specimens to us for verification.—*Ed. Journ. Bot.*]

WOLFFIA ARRHIZA.—This little plant has been collected by Mr. H. C. Watson from a dirty geese-frequented pond on Weston Green, near Thames Ditton, where he has botanised for forty years without ever noticing the plant before. Can it be that *Wolffia* has been overlooked all these years, there and elsewhere, or is this Duckweed gradually extending itself and occupying new stations?

BABINGTONIA, *F. Mueller*.—This commemorates the venerable Professor of Botany at Cambridge; the former genus *Babingtonia*, of Lindley, having been reduced to *Bæckea*. The new genus is founded upon *Baxteria australis*, R.Br., a Xerotideous plant from King George's Sound and Cape Rich, Australia; the name *Baxtera* having been previously given to a genus of *Asclepiadeæ*, by Reichenbach.

CAREX ORNITHOPODA, *Willd.* IN ENGLAND.—On May 31, 1874, Mr. John Whitehead, of Dukinfield, was in company with Messrs. H. Newton and E. Hibbert, when they found *Carex ornithopoda* in Miller's Dale, near Buxton, Derbyshire. He has kindly sent me a specimen of the plant, and informs me that Mr. Watson gives it the same name which I do.—C. C. BABINGTON.—[We also have to thank Mr. Whitehead for a specimen of this interesting addition to the British Flora. —*Ed. Journ. Bot.*]

Notices of Books.

Prodromus Monographiæ Œdogoniearum, auctore VEIT BRECHER WITTROCK. (Act. Reg. Soc. Sci. Upsal., Ser. iii., vol. ix., 1874.)

ALTHOUGH Dr. Wittrock, as he states, has been occupied for a space stretching over some seven years in studying the species of the *Œdogonieæ* with a view to the publication of a Monograph of that Family, still, owing to the unexpected multiplicity of distinct forms, he remarks that, as he goes on, the end proposed to himself seems rather to recede than to approach. He thinks that the copiousness of forms in this group known to him would still receive a considerable accession from countries as yet unexplored, whilst in many points touching their morphology and physiology, notwithstanding all that is due to Pringsheim, there is much to learn; thus as relates to the germination of the oospores, this has been observed in only three species, one each by Pringsheim, Cleve, and Juranyi, whilst their observations are more or less mutually discrepant; the author's own efforts in this direction had not produced much result.

The *Œdogonieæ* form a Family sufficiently well-defined; on the one hand the *Coleochæteæ* approach them, on the other the *Sphæropleæ*. These three Families would seem to form together a single Class, which, drawing the designation from the middle and largest of them, should be called *Œdogoniaceæ*. This Class might be defined as follows:—*Œdogoniaceæ*: Cellular plants (of the fresh water), forming confervoid filaments with chlorophyllaceous cells, simple or branched, rarely forming parenchymatous, monostromatic discs; female organs oogonia; male organs spermogonia, producing ciliated spermatozoids; oospores, produced by fecundation, in germination giving rise to zoospores; agamospores motile (zoospores), formed singly in each vegetative cell (such zoospores not yet observed in *Sphæroplea*).

The family *Œdogonieæ* consists of two distinct genera, *Œdogonium*, Link, and *Bulbochæte*, Ag., as already set forth by Pringsheim.* Each genus has a monoicous and dioicous section. The dioicous species of *Œdogonium* form two sub-sections—one contains those species which possess dwarf males epiphytic on the female plants ("nannandrous" species)—the other such as have male plants of the same magnitude as the female and not epiphytic ("macrandrous species.")

The dwarf males ("nannandres") are not developed to the same degree in different species. Those which most approach the monoicous forms have male plants so little developed that they contain but one cell ("unicellular nannandres"), all spermogonium, the contents of which become divided into two motile spermatozoids. Other species there are in which the dwarf male plants consist of at least two cells, one inferior which remains vegetative ("stipes"), and one or a few superior cells producing two spermatozoids. These upper cells are produced either by ordinary self-division, when, in accordance with Pringsheim's nomenclature, we have an "inner" spermogonium (antheridium), or they are formed by that process of division which is characteristic of the vegetative mode of growth in the *Œdogonieæ* ("per partitionem œdogoniaceam"); that is to say, in such a way that the membrane of the mother cell becomes transversely cleft, in which latter case (also in unison with Pringsheim) we have an "outer" spermogonium. The *inner* spermogonium is unicellular, the *outer* is either uni- or pluricellular. A few nannandrous species with outer spermogonium have sometimes the stipes pluricellular, such species seemingly, as it were, forming a connecting link between the nannandrous and macrandrous forms. The dwarf males have their origin from a special kind of zoospores (androspores, Pringsheim); these are produced mostly in certain cells (androsporangia) of the female individuals ("gynandrosporous species," Pringsheim), or they are produced in certain cells of neuter individuals ("idioandrosporous species.")

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* Pringsheim: "Beiträge zur Morphologie und Systematik der Algen: Morphologie der *Œdogonien*," in his "Jahrbücher für wiss. Botanik," B. i., p. 1.

In *Bulbochæte* dioicous macrandrous species are wanting; on the other hand, many species are dioicous nannandrous, the dwarf males being sometimes unicellular or again bi- or pluri-cellular; the latter may have inner or outer spermogonia. By far the greatest number of the species are gynandrosporous—one only as yet observed, *B. polyandra*, Cleve, being idioandrosporous.

The oogonia of both the genera before fecundation present an opening in the membrane. In some species of *Œdogonium* this has the form of a minute pore formed in the primary membrane of the oogonium, without any preceding annular rupture of it ("oogonia poro aperta"). In many, if indeed not in all species, there can be detected beneath the pore a secondary membrane, which in its turn becomes perforate. In other species of this genus an annular dehiscence of the membrane of the oogonium takes place, for the most part median, concurrently with which a second membranous portion becomes inserted, in which is formed the pore ("oogonia circumscissa, poro in circumscissione"). Again in others the membrane of the oogonium becomes cleft near the apex, not, however, completely, but so that the upper portion of the membrane coheres at one place with the lower; the upper portion of the membrane becomes raised up at one side as an operculum; when this cleft-like opening is produced the secondary membrane, furnished with a pore, makes itself evident ("oogonia operculo aperta").

The oogonia in *Bulbochæte* appear to be formed after a double manner. Sometimes they are produced by a horizontal division of the mother cells. In such case the two supporting cells (seen in optical vertical section) are tetragonal, and sustain the oogonium only. Such oogonia the author denominates "erect." But for the most part oogonia arise from oblique division of the mother or grandmother cell. Of the supporting cells in such case one or other (in diverse cases) becomes pentagonal, the other tetragonal, and commonly bear next to the oogonium, a simple vegetative cell or a terminal bristle. Such oogonia are named "patent." The spermogonia likewise are of a double nature, sometimes "erect," arising by horizontal division, sometimes "patent," by oblique division.

Dr. Wittrock adds a few remarks respecting the fixity of the specific characters in these plants, of which, indeed, with but a small fractional proportion of his great experience, we ourselves feel very well assured. And this constancy manifests itself not only in those characters *a priori* of the greatest importance, such as the disposition of the organs of fructification and their specialities, but even in such which are ordinarily of minor importance, as, for instance, the dimensions of the cells, the position of the dwarf males on the female plant, and such like.

As illustrations of this constancy the author adduces examples of *Œ. crispum* (Hass.), Wittr., gathered from the Andes, which coincided in even the most minute details with Swedish specimens; examples of *Œ. upsaliense*, Wittr., *Bulbochæte intermedia*, De Bary, and of many others taken in Greenland and in Europe were *inter se* in no way different; *B. elatior*, Prings., and *B. rhadinospora*, Wittr., from Tasmania absolutely agreed in all their parts with Swedish examples.

As regards the geographical distribution of the family, they are cosmopolitan; of each genus some species have been observed in arctic, some in tropical regions. Where they occur in the greatest plenitude could not yet be predicated, and if Sweden should appear from the enumeration to be the most rich, this, the author thinks, is only because that country has been the most diligently searched.

The aggregate number of species of both genera known reaches 140. They are all inhabitants of fresh water; they are mostly epiphytic, seated upon the most varied aquatic plants.

The author enumerates and gives the diagnosis of the whole of the species, embracing those previously made known in his preceding works:—"Dispositio Œdogoniacearum Suecicarum" (in "Öfversigt af Kongl. Vetenskaps Akademiens Forhandlingar," 1870), also "Œdogoniaceæ novæ, in Suecia lectæ" (in "Botaniska Notiser," 1872), as well as those of preceding authors (including of course Pringsheim) as identified by him. The single beautiful plate accompanying, embracing indeed but twelve species, renders it a matter of regret that a figure of *each* of the known species from his graphic pencil is not concomitantly forthcoming; it is true that the author refers to the but comparatively few published figures of Pringsheim, Kützing, de Bary, Hassall, and his own, but figures of all his new species would have been most welcome to future students of the group.

The following is the arrangement made use of:—

Genus 1.—OEDOGONIUM (Link.).

Section I. Monoicous Species.

A. Oogonia never furnished with median processes.
  a. Oospores globose or subglobose.
    α. Oogonia globose or subglobose (23 species).
    β. Oogonia ellipsoidal or oviform (2 species).
  b. Oospores ellipsoidal or oviform (5 species).
B. Oogonia furnished with median verticillate processes.
  a. Oospores subglobose (2 species).
  b. Oospores subellipsoidal (1 species).

Section II. Dioicous Species.

Subsection I. Nannandrous Species.

A. Dwarf males (nannandres) unicellular.
  a. Oogonia furnished with median verticillate processes (2 species).
  b. Oogonia never furnished with median processes.
    α. Oospores globose or subglobose (7 species).
    β. Oospores subellipsoidal (1 species).
B. Dwarf males (nannandres) bicellular, spermogonium "inner" (1 species).
C. Dwarf males bi-pluricellular, spermogonium "outer."
  a. Oospores smooth.
    α. Oospores globose or subglobose (8 species).
    β. Oospores ellipsoidal or oviform (7 species).
  b. Oospores echinate.
    α. Oospores globose (5 species).
    β. Oospores ellipsoidal (1 species).

Subsection II. Macrandrous Species.

- *a*. Oospores echinate (1 species).
- *b*. Oospores smooth.
  - *α*. Oogonia not or but slightly tumid (3 species).
  - *β*. Oogonia manifestly tumid.
    - *αα*. Oospores globose or subglobose (7 species).
    - *ββ*. Oospores ellipsoidal or oviform (5 species).

There then follow more or less partial descriptions of 24 further species of *Œdogonium*, whose organs of fructification not being sufficiently known to the author, they cannot be relegated to their proper position in the preceding scheme or plan of arrangement. Of these all the more desirable and welcome would have been figures at least of such not hitherto extant, pictorially bringing to view the details known, and, therefore at same time, indicating the lacunæ in our knowledge as respects them.

Genus 2. BULBOCHÆTE, (Ag.).

Section I. Oogonia globose or subglobose, patent (except *B. Brébisonii*, in which the oogonia are erect, and *B. elatior*, Prings., erect or patent), oospores of the same form as the oogonia, and completely filling them; upper supporting cell in vertical optical section pentagonal (except the two species just mentioned, when oogonia are *erect*, each supporting cell is tetragonal). All the (known) species of this section are dioicous nannandrous, and(except *B. polyandra*, Cleve) are gynandrosporous.

- A. Dwarf males (nannandres) unicellular (1 species).
- B. Dwarf males bicellular, spermogonium "inner."
  - *a*. Basal cell (stipes) of the dwarf males shorter than the spermogonium (10 species).
  - *b*. Basal cell (stipes) of the dwarf males longer than the spermogonium (2 species).
- C. Dwarf males bicellular, spermogonium "outer" (2 species).

Section II. Oogonia ellipsoidal or subellipsoidal; oospores the same form as the oogonia and completely filling them, epispore longitudinally costate, costæ more or less crenulate; septum of the supporting cells situated in their upper part (seemingly absent in *B. pygmæum*, Prings.), upper supporting cell (in optical vertical section) tetragonal, lower pentagonal, more rarely (when oogonia erect) tetragonal.

Subsection I. Monoicous Species (6 species).

Subsection II. Dioicous Species. Nannandrous and gynandrosporous. Dwarf males straight stipitate; spermogonia "outer," 2—5-cellular.

- A. Supporting cells wanting septum (1 species).
- B. Supporting cells possessing a septum (11 species).

To the foregoing are added (partial) descriptions of two species whose organs of fructification are not sufficiently known to the author, hence their precise position uncertain.

Subordinate to the "sectional" distinctions as indicated above, those characters appertaining to the species which come into play to discriminate between them, and arranged in the sequence of comparative importance, are the following: whether gynandrosporous or idianodrosporous; whether the oogonia are single or several together; the form of the oogonia; the form and mode and position of the aperture; the form and character of surface of the oospore; whether the oospore does or does not completely fill the cavity of the oogonium; characters (form, position, &c.) of the androsporangium (in gynandrosporous species) and the form and position of the dwarf males (in the nannandrous species); in *Bulbochæte* whether the oogonia are erect or patent, or both; form and size of terminal and vegetative cells; general dimensions, aspect, and habit.

Such is an abstract of the most important communication (after Prof. Pringsheim's) yet published on this very interesting group, composed indeed of but two allied but well-distinguished genera, the species of which are wonderfully numerous, yet marvellously sharply marked off, considering the comparative simplicity of structure by which they are characterised.

WM. ARCHER.

Observations sur le calice des Composées. Une Anticritique. Par M. SAMSÖE LUND, Cand. Phil. Copenhague. 1874. (Extrait des "Videnskabelige Meddelelser fra naturhistorisk Forening i Kjobenhavn." Aargang 1873.)

IN this paper M. Samsöe Lund replies chiefly to the remarks of M. Warming made in a critical notice of a former paper of M. Lund's—"Le calice des Composées, essai sur l'unité du développement dans le règne végétal," and already noticed in the "Journal of Botany."* M. Lund maintains that the "pappus" of the Compositæ is a true calyx, while M. Warming states that the pappus is a series of trichomes or hairs. The main propositions of M. Lund are, as follow. 1st. The pappus occupies the position of a calyx, external to the corolla, and exists in most of the Compositæ. 2nd. That the study of the structure and development of the pappus shows that although the various forms differ much among themselves, they all exhibit a more or less gradual transition from the one to the other. From an examination of leaves and portions of the pappus of *Cirsium arvense* M. Lund concludes that the parts of the pappus possess the general characters of the leaves of phanerogams, and also agree in their nature with the leaves forming the involucre of the plant. 3. Position and number of the parts of the pappus. In *Gaillardia rustica* and *Catananche cœrulea* the pappus consists of a regular verticil of 5 parts alternating with the 5 petals. *Centaurea scabiosa* has 25 parts in several verticils. *Sonchus* 1 verticil of 15 parts. *Centaurea Jacea*, one verticil of 10 parts. Verticils of from 2 to 4 parts also occur. *Bidens tripartita* has 2 parts of the pappus placed right and left. *Helianthus annuus* and *Actinomeris*, 2 parts placed anteriorly and posteriorly. M. Lund holds that in the great majority of cases the position of the part of the pappus is not irregular, at least not more so than that of true leaves, which frequently show displacement and irregularities. M. Warming states that the position of parts of the pappus is not fixed, and that they show no trace of phyllotaxis. 4. The time at which the pappus appears is important. According to M. Lund, the late development of the pappus is in harmony with the function it performs in the scattering of the fruits, and he holds that there are numerous instances of leaves developing behind older leaves. 5. Occasionally in malformed flowers large flat green bodies resembling sepals are found in place of the pappus.

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* Journ. Bot., 1873, p. 184.

If M. Lund would kindly tell us what he means by a true calyx many of our difficulties would disappear. Mr. Bentham (Handbook: Introduction) says: "A complete symmetrical flower consists usually of either four or five whorls of altered *leaves* placed immediately one within the other. The calyx forms the outer whorl." Prof. Oliver (Lessons, p. 21) says: "The two outer series of flower-leaves, the sepals and petals, may be regarded simply as organs designed to protect the smaller and more delicate parts which they enclose," &c. Morphologically the calyx consists of modified leaves, physiologically it acts chiefly as a protecting covering. Recent researches, however, have shown that all the parts of the flower cannot be considered to be modified leaves. In *Naias*, *Casuarina*, and *Typha*, according to Magnus and Rohrbach (See Sach's Lehrbuch, ed. 3, p. 464), the stamens are morphologically stem-structures, that is, modified caulomes, and not modified phyllomes. Is it then necessary that the parts of the perianth should invariably be phyllomes? Take the 6 hypogynous bristles in *Scirpus*, and we feel very much inclined to say that we have a perianth of 6 parts, 3 outer, calyx; 3 inner, corolla, and yet that these structures were trichomes and not phyllomes. M. Lund thinks he has proved that the parts of the pappus are leaves, but of a low type. He shows that the parts do not develope from a single superficial cell like most true hairs, but that a cell of the periblem also enters into their composition. This, however, is not a proof that the structure is a phyllome, because we know that in the prickles of the rose the periblem aids in the development in addition to the superficial cells. If M. Lund holds that the pappus is a calyx because it consists of modified leaves, we assert that he has not proved his point, there being more evidence in favour of the parts being trichomes than phyllomes. If M. Lund had considered it possible for a calyx to consist morphologically of trichomes and not exclusively of phyllomes we might have been disposed to agree with him, but he does not. The function of the calyx is chiefly protection, the function of the pappus is scattering the fruit, and for this purpose it is developed later, after the covering of the flower, and must be placed physiologically among the organs for scattering flowers and seed, as wings and hairs, such, for example, as those on the seeds of *Epilobium*, willow, &c. We, therefore, hold that M. Lund fails to prove his position, both morphologically and physiologically, and conclude that the pappus is a *series* of *hairs* developed for the purpose of *scattering* the *fruits*. Into the other part of M. Lund's paper we shall not follow him.

W. R. McNab.

Handbook of the Ferns of Queensland. By F. M. Bailey. With twenty-two plates illustrative of the genera by H. E. Eaton. Brisbane: Thorne and Greenwell, 1874. (8vo, pp. 72.)

This little work is very creditable, both to the author and to the colonial artist and printer, and we welcome, as a mark how a taste for botany is spreading in our colonies, the fact that within a short time, special handbooks of the Ferns of three of them, Natal, Ceylon, and now Queensland, have been published by residents who have thoroughly searched out the districts for themselves. But some of the preface of this Queensland handbook is simply absurd. "The ferns of Australia have not attracted the attention they deserve, either from collectors or scientific men, and it is certainly not owing to the scarcity of ferns in Australia, nor to the want of interest attached to them. They are both abundant and of high interest, more especially so in the colony of Queensland, where some of the rarest ferns have representatives. It need scarcely be said that no class of plants is so well worthy of notice, both from scientific men and from amateurs. Little, however, has been done by the former towards their arrangement, &c., which may be doubtless attributed to the fact of the larger and more important classes of the vegetable kingdom absorbing all the spare botanical talent. The indefatigable Baron von Mueller is the only one who has approached the subject."

Dr. von Mueller has done far too much for Australian botany to need to be complimented at other people's expense, and the fact is that the Australian ferns were so thoroughly and accurately worked out by Robert Brown in 1810, that all that has been left for those that have followed has been to add in the new discoveries, and describe the species in fuller detail; and that there is not a general book on Ferns among the many that have been written during the last sixty years in which the Australian species have not received their full share of attention. However, if not well versed in the literature of his subject, Mr. Bailey has evidently studied carefully the plants themselves, and does not aim at making new genera and species, or inventing a classification of his own. There are upwards of 140 ferns in the colony, and he has adopted the genera and descriptions of Moore's "Index Filicum." We are pleased to see that he seems generally to have drawn up the descriptions of the species for himself, and that they are both full and accurate. Good practical plates are given of the essential characteristics of the 63 genera, so that the result of his labours is a handy little book by means of which anyone in the colony may, with a little pains, make out the name for himself of any fern he sees, and classify his gatherings. We make a few remarks and criticisms on points of detail. The author does not understand correctly the plan of quoting authorities for specific names. Under *Litobochia* he calls the three Queensland species, *L. tripartita*, Sw., *L. Milneana*, Baker, and *L. vespertilionis*, Presl. A plant was named *Pteris vespertilionis* by Labillardière, which was placed by Presl in *Litobrochia*. Another plant was named *Pteris tripartita* by Swartz, and this was also placed by Presl in *Litobrochia*. So that the proper way to cite them under *Litobrochia* is either *L. tripartita*, Presl and *L. vespertilionis*, Presl., or *L. tripartita* (Sw., as *Pteris*), and *L. vespertilionis* (Labill. as *Pteris*). In both the cases, however, there are older specific names for the plants. The Queensland *Lindsæa*, published in our columns as *L. heterophylla*, in forgetfulness of that name being preoccupied by Dryander, Mr. Bailey now describes as *L. dimorpha*. In some cases the species are badly arranged under the genera. For instance (p. 38, 39), *Polypodium Hookeri*, a little *Eupolypodium*, with simple fronds, is interpolated between *P. rugulosum* and *pallidum*, two large decompound species of *Phegopteris*, so near to one another that many writers have placed them as mere varieties. *Gonopteris Kennedyi* is a mere synonym of *G. urophylla*, and yet Mr. Bailey puts one first and the other last out of five Queensland species. "*G. Gheisbreghtii*, Linden," is not Linden's plant, which is a native of Tropical America, but *Polypodium Hillii*, Baker, a new species published in the second edition of Hooker and Baker's "Synopsis Filicum." The *Trichomanes*, described but not named at page 60, is, we learn from speciмens forwarded, the cosmopolitan *T. pyxidiferum*, now found in Australia for the first time. J. G. B.

Nomenclator Botanicus. Nominum ad finem anni 1858 publici factorum, classes, ordines, tribus, familias, divisiones, genera, subgenera vel sectiones designantium enumeratio alphabetica, &c. Conscripsit Ludovicus Pfeiffer. Cassellis 1873-74. Sumptibus Th. Fischeri.

We take the liberty of calling the attention of our colleagues to a work which, begun two years ago (see Journ. Bot., 1872, p. 61), is now near its completion, the "Nomenclator Botanicus," of Dr. L. Pfeiffer, the well-known author of a monograph of the *Cactaceæ*, and of other valuable contributions to botany and the other natural sciences.

Our literature already possesses several works of a similar title, but none of the same extent and completeness. To make a comparirison between Dr. Pfeiffer's book and the best known and most recent of those works, Steudel's "Nomenclator," the latter gives an alphabetical index of the classes and species known, with the synonyms of all the phanerogams; the cryptogams are excluded. The work of Pfeiffer, it is true, does not contain the species with the exception of the typical ones, but extends only to the subgenera and sections; it comprises however besides the phanerogams, the cryptogams and fossils, in short the whole vegetable kingdom. In Steudel's works there are but fragmentary and partial references, which are often quite insufficient; Pfeiffer, on the contrary, has made this point his principal task. Here you do not only find citations of the first authors of the family, class, and genera, but also the names, volumes, pages, and dates of all the general systematic works (from Tournefort to the present time), in which those groups have been treated, as well as references to places where anything remarkable has been published upon them.

The arrangement is alphabetical, and under every name the citations are put in historical order. In separate paragraphs are placed together those authors who agree in opinion as to the position of the particular group, with the addition of the opinion itself. This affords a well-arranged view of the transformations which the system in general, as well as each single group, have experienced in course of time. The historical literary section is the most valuable part of the work of Pfeiffer. The name of its author already stood security for scientific accuracy, but on reviewing the long series of citations, and after having convinced ourselves of their completeness and trustworthiness, we cannot help expressing our astonishment at the extraordinary assiduity and extensive learning which achieved such a task. The remarks, too, on the etymology of the names are of special value. At present the work comprises only the names known up to the end of 1853, but it is expected that all those which have been since published will be treated in a supplement. The get-up of the book is excellent in every respect, and considering its contents, the price of it is very moderate. We believe the work is most highly to be recommended to all our colleagues as one of the greatest importance to all who make systematic botany their study; as a book for consultation it is indeed quite indispensable, saving the pains and time which would be spent in the search after extremely dispersed notices; every systematist knows what advantage hereby results to him and to science in general. The work being written in Latin is accessible to the learned men of all nations.

A. W. EICHLER.

Batographische Abhandlungen, von Dr. W. O. FOCKE. (A reprint from the Transactions of the Natural History Society of Bremen.)

This is a pamphlet with which all Bramble students should make acquaintance. It does not deal at all with the complicated European forms, but gives a general review and classification of the extra-European species, classified under their five geographical areas—America, Australia, Africa with the Atlantic isles, Northern Asia, and Tropical Asia. Adding these to Europe, we get six geographical Bramble-areas, and extremely few species reach beyond one of them. The extra-European species have been much neglected, and Dr. Focke finds a great many new ones to describe, nearly all of which, after going through the specimens, we believe will stand as good species in a broad sense. He takes pains to work out, name, and define the best groups or subgenera, a thing which has scarcely been attempted since the monograph in the Prodromus, and for several of the areas gives full synoptical tables of species. In America he admits upwards of sixty species (a dozen described as new); for Australia, including Polynesia and New Zealand nine; for Africa, including the Mascarene and Atlantic islands fourteen; for Russia fifteen. For Tropical Asia and Europe he does not attempt to give numbers, but for the former describes eight new species. Altogether there is a large amount of Bramble-information packed lightly in this unpretending pamphlet.

J. G. B.

Botanical News.

ARTICLES IN JOURNALS.—OCTOBER.

Monthly Microsc. Journ.—R. Braithwaite, "*Sphagnum Lindbergii*, Schimp., and *S. Wulfii*, Girgens." (tab. 76, 77.)

Oesterr. Bot. Zeitschr.—M. Winkler, "Recollections of a journey in Spain."—J. L. Holuby, "A new *Cuscuta*" (*C. Solani.*).—A. Kerner, "On Flora of Lower Austria" (contd.).—F. Antoine, "On *Eucalyptus* cultivation."—J. L. Holuby, "On cryptogamic flora of Podhrad."—J. C. Schlosser, "The Kalniker Gebrige" (contd.).

Flora.—E. Fleischer, "On Embryology of Dicotyledons and Monocotyledons" (contd.).—F. Arnold, "Lichenological Fragments, xvii." (contd.).—H. Christ, "*Rosa*-forms of Switzerland and neighbouring countries in 1873, pt. ii."

Bot. Zeitung.—P. Ascherson, "Report of botanical results of Rolf's expedition to the Libyan Desert" (contd.).—F. Hegelmaier, "On the Development of the Monocotyledonous embryo, &c." (contd.).

Hedwigia.—V. von Trevisan de St. Léon, "Two new species of *Aspidium*" (*A. asterolepis*, Trevis., *A. hemicardion*, Trevis.).—Von Thumen, "On *Protomyces pachydermus*."

Journ. Linn. Soc. (No. 77, Oct. 17th).—"Contributions to the Botany of the expedition of H.M.S. *Challenger*," (twenty papers on Botany of Bermudas, St. Thomas, Azores, Cape Verdes, St. Paul's Rocks, Fernando de Noronha, Bahia, Tristan d'Acunha, Inacessible I., Marion I., Kerguelen's Land, and Yong I.).

New Books.—Th. Fries, "Lichenographia," pt. ii.—W. O. Focke, "Batographische Abhandlungen."—E. Gibert, "Enumeratio plantarum sponte nascentium agro Montevidensi, &c." (Montevideo, 1873.)—Mrs. F. A. Kitchener, "A Year's Botany" (Rivington's).

Since the death of Dr. Torrey, his report on the Botanical collections made by the naturalist of Wilkes' expedition on the western coast of N. America, has been printed under the care of Prof. Asa Gray. It makes the larger part of the 17th volume of the results of that expedition, of which, like the rest, only 100 copies are printed by Congress; a small number of extra copies, however, have been secured at private expense and bound up into one volume with the account of the lower Cryptogamia of the expedition.

The second part of vol. xxx. of the Linnean Society's Transactions is recently issued. It contains a complete monograph of the *Lecythidaceæ* by Mr. Miers, illustrated by 33 plates from his pencil. The species are distributed under 12 genera and mount up to 183, a greater number, as the author observes, than would be warranted were it not that the large woody fruits in museums can rarely be matched with herbarium specimens, and consequently appear as separate species.

The 63rd fascicle of the Flora Brasiliensis contains the *Polygalaceæ* worked out by Mr. A. W. Bennett; the 64th (vol. xi., pt. 2) the second portion of the *Euphorbiaceæ* by J. Müller.

A translation of Dr. Ascherson's account in the "Botanische Zeitung," of the botanical results of Rohlf's exploration of the Libyan Desert, has been published in the Gardener's Chronicle. The report also contains the observations of Dr. Schweinfurth on a journey to the oasis of Khargeh, made about the same time as Rohlf's expedition.

Under the title of "Prodrome de la Flore du Grand-Duché de Luxembourg," M. J. P. J. Koltz has published the first part, including the Phanerogams, of a complete catalogue of the plants of that district, with copious localities. Luxembourg occupies a position of interest in a geographico-botanical point of view, and the publication of this catalogue fills up a gap in European floras. A short historico-literary introduction is prefixed.

Miss E. Hodgson has liberally presented specimens of all the species enumerated in her catalogue of Lake Lancashire plants, printed in our pages, to the British Museum.

Mr. Crombie has just issued Century I, of his "*Lichenes Britannici Exsiccati*," containing many of the rarer and the new species not included in the *Exsiccati* of Leighton and Mudd. The few copies published are intended solely for public herbaria.

Mr. John E. Vize, Forden Vicarage, Welshpool, is issuing a Fasciculus of 100 specimens of Microscopic Fungi of the groups *Puccinimi*, *Cæomacei*, *Œcidiacei*, *Mucedines*, *Erysiphei*. The price is £1.

Dr. McNab is at present forming a British Herbarium at the Royal College of Science, Dublin, and would be glad if any friends would assist him by donations of rare or critical species.

We understand that Dr. Boswell Syme is at work on the British Ferns, for an additional volume of "English Botany." A supplement is also in preparation, to include the additions to the Phanerogamic flora of Britain, which have been made during and since the publication of the eleven volumes of the book.

As there was no Exchange Club distribution this year Dr. Syme does not think there is any occasion to print a report; it is confidently hoped that next year will see both distribution and report issued in good time.

The death is recorded in the Gardener's Chronicle for November 14th, of Joseph Evans, one of the botanists in humble life, of South Lancashire. He was a native of Boothstown, a village near Manchester, and at the time of his death, on June 23rd, was 71 years old; from his knowledge of the medicinal properties of plants he was called by the inhabitants "Dr." Evans.

We regret to announce the death of Dr. Edwin Lankester, Coroner for Central Middlesex, at Margate, on October 30th. Best known as a promoter of sanitary and economic science, and as an admirable lecturer and writer, he possessed an extensive knowledge of natural history, and has published numerous books and papers on microscopical and general zoology and botany. In 1849 he translated Schleiden's "Principles of Scientific Botany;" he was also the author of an account of Askern in Yorkshire, which contains a local Flora. He was elected F.R.S. in 1845, in which year Lindley dedicated to him the Acanthaceous genus *Lankesteria*.

We are sorry to have to record the death of Mrs. Hooker, wife of the Director of Kew Gardens. The sad event happened suddenly and unexpectedly on November 13th. Mrs. Hooker was a daughter of the late Professor Henslow of Cambridge; she possessed considerable literary abilities and is well known to have greatly assisted Dr. Hooker in his various undertakings connected with botanical literature. Her most extensive work is the English translation of Le Maout and Decaisne's "Traité général de Botanique," which was edited by Dr. Hooker and noticed in this Journal last year (1873, p. 153). We, in common with all botanists, sympathise with Dr. Hooker in the great loss he has sustained, which will be felt also in a large circle of friends.

The death is announced, on November 21st, at Sandown, Isle of Wight, of Sir William Jardine, Bart., of Lockerby, Dumfries, at the age of seventy-four. Though his chief scientific work was in the department of ornithology, he was a naturalist in the wide sense of the word and established the "Magazine of Zoology and Botany," afterwards the "Annals of Natural History," which in 1841 was combined with the "Magazine of Natural History," to form the "Ann. and Mag. Nat. Hist.," still continued. He was a Fellow of the Royal and Linnean Societies.

ERRATA AND CORRIGENDA.

Page 29, line 24, *for* Broome *read* Boon. P. 31, l. 22 from bottom, *for* xviii *read* xix. P. 32, l. 16 from bottom, *for* Bigclovia *read* Bigelovia. P. 63, l. 26, *for* Smethwick *read* Southwick. P. 64, l. 3 from bottom *for* specimen *read* specimens. P. 113, bottom line, *for* xxviii. *read* xxix; and so throughout the article. P. 116, l. 26 from bottom, *for* GUTHRIEAT *read* GUTHRIÆA. P. 118, l. 10, *for* BALDEVIAMÆ *read* BALDERRAMÆ. P. 125, l. 20 from bottom *for* Areschong *read* Areschoug. P. 127, l. 4 from bottom, *for* Bask *read* Busk. P. 158, l. 5, *for* in *read* into. P. 160, l. 4, *for* a sexual *read* asexual. P. 162, l. 17, 18 from bottom, *for* Warner *read* Warren. P. 190, l. 2 from bottom, *for* Revue *read* Belgique. P. 192, l. 17, *for* two *read* one. P. 237, l. 13 from bottom, *for* N.B., 616 *read* New B.G., 516. P. 256, l. 27 from bottom, *for Fokbrai read Tokbrai*. P. 256, l. 26 from bottom, *for Balanostieblus read Balanostreblus*. P. 274. l. 2, *for* east *read* west. P. 277, l. 4 from bottom, *for* kedge *read* hedge. P. 295, l. 7, *for Jæschka read Jæschke*. P. 307, l. 2 from bottom, *for* Meisoner *read* Meissner. P. 320, l. 20 from bottom, *dele* (*Bruchia vogesiaca*). P. 320, bottom line, *for* 314 *read* 318. P. 321, l. 15, *for* from 2 to 3 inches *read* scarcely an inch. P. 325, l. 22 from bottom, *for juncifolius read junciformis*. P. l. 325, 9 and 10 from bottom, take out the brackets. P. 328, l. 17 from bottom *for* uncommon *read* common. Tab. 153, *for* Woohopensis *read* Woolhopensis.

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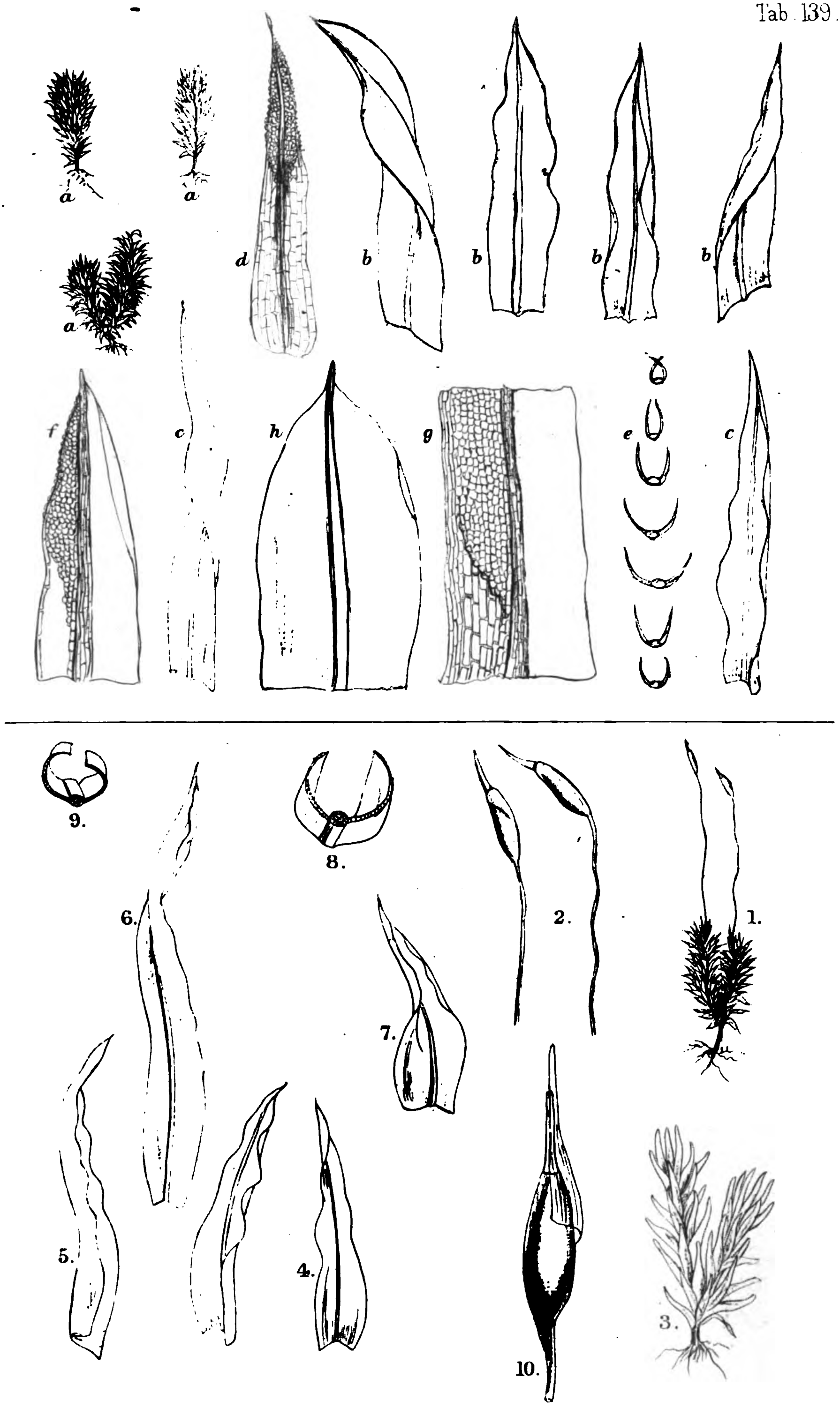

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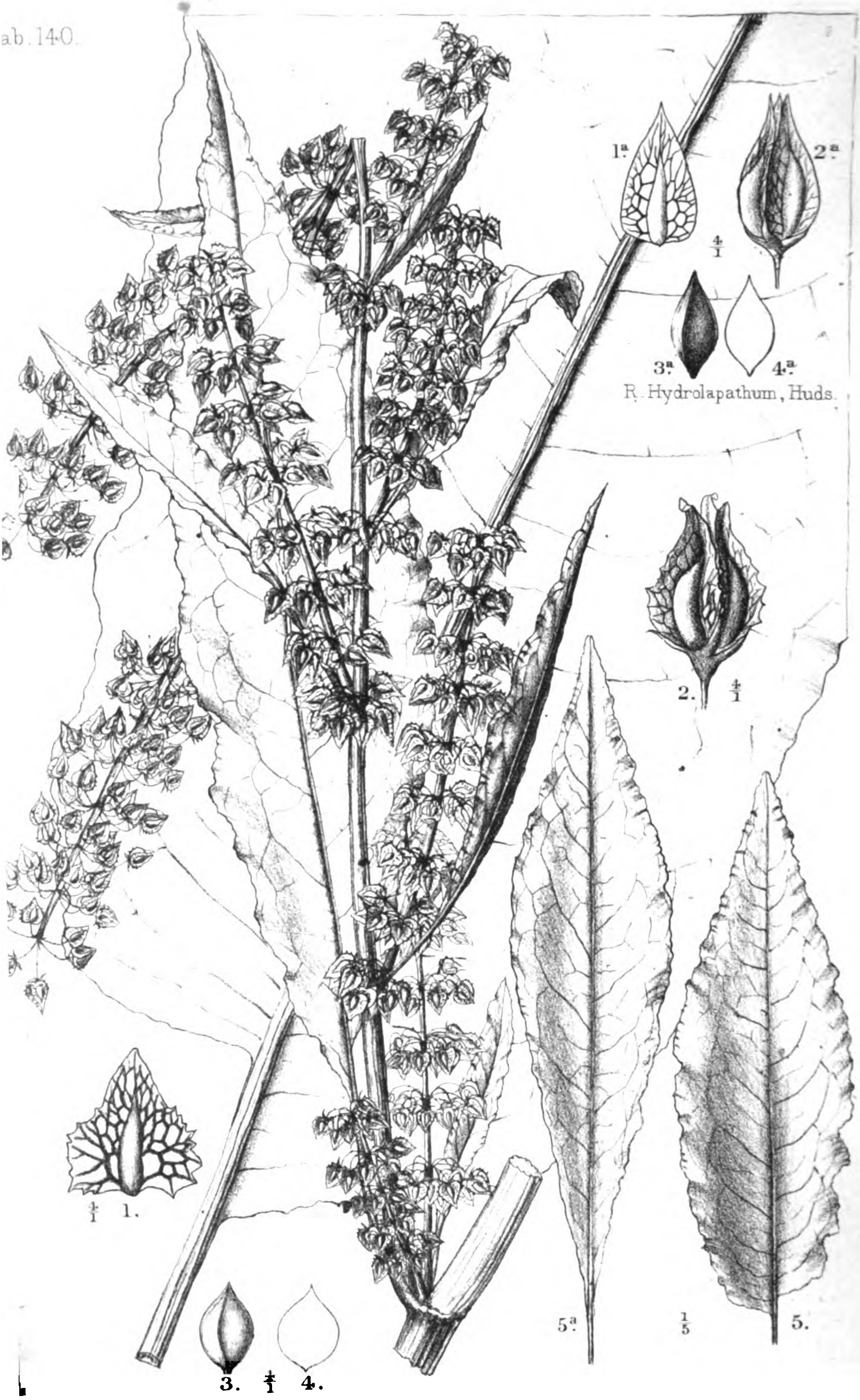
Tortula inclinata, Hook & Grev.



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Rumex maximus, Schreb.

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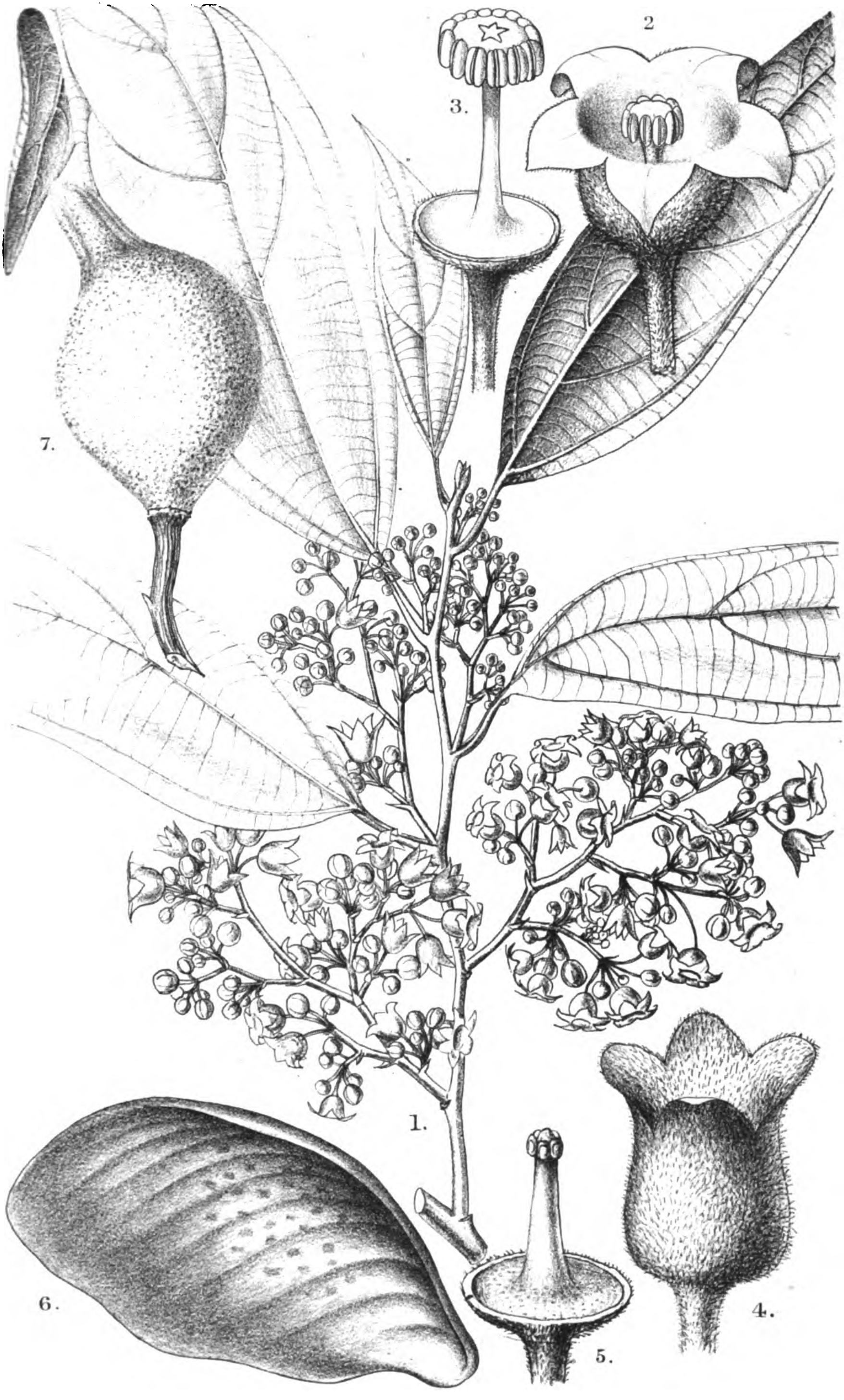

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Fig. 1—3. Heritiera acuminata *Wall.* 4—6. H. dubia. *Wall.*

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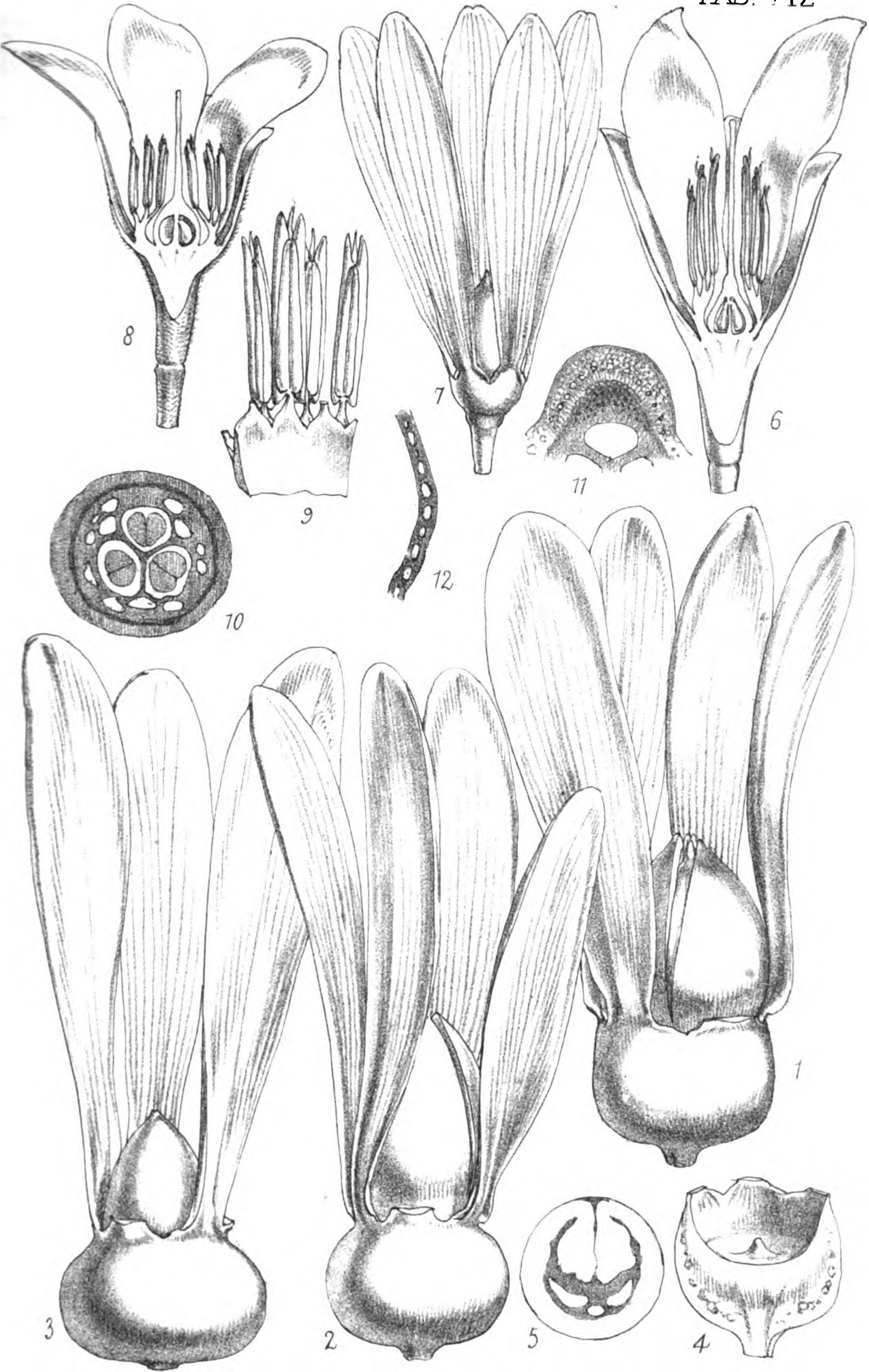

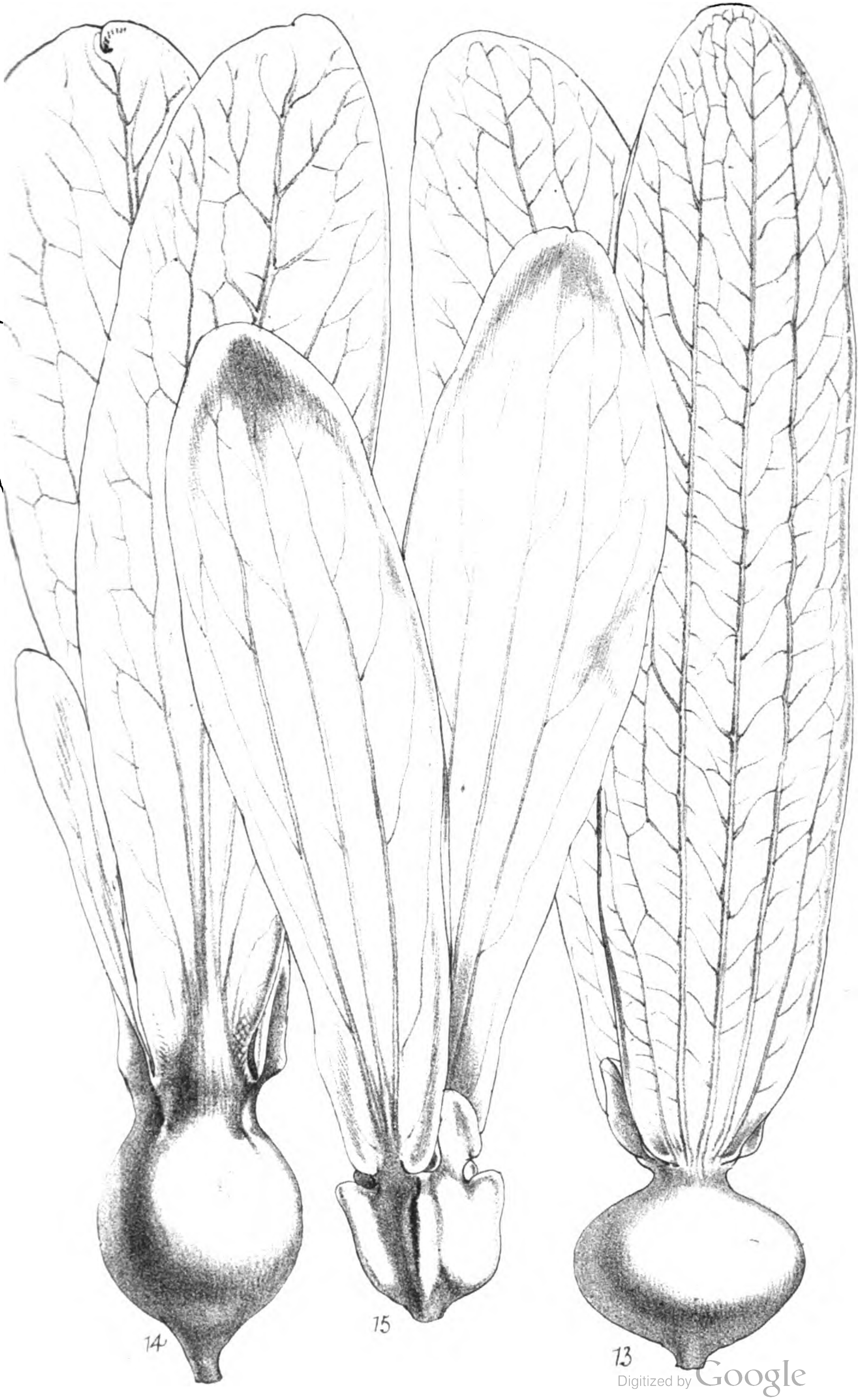
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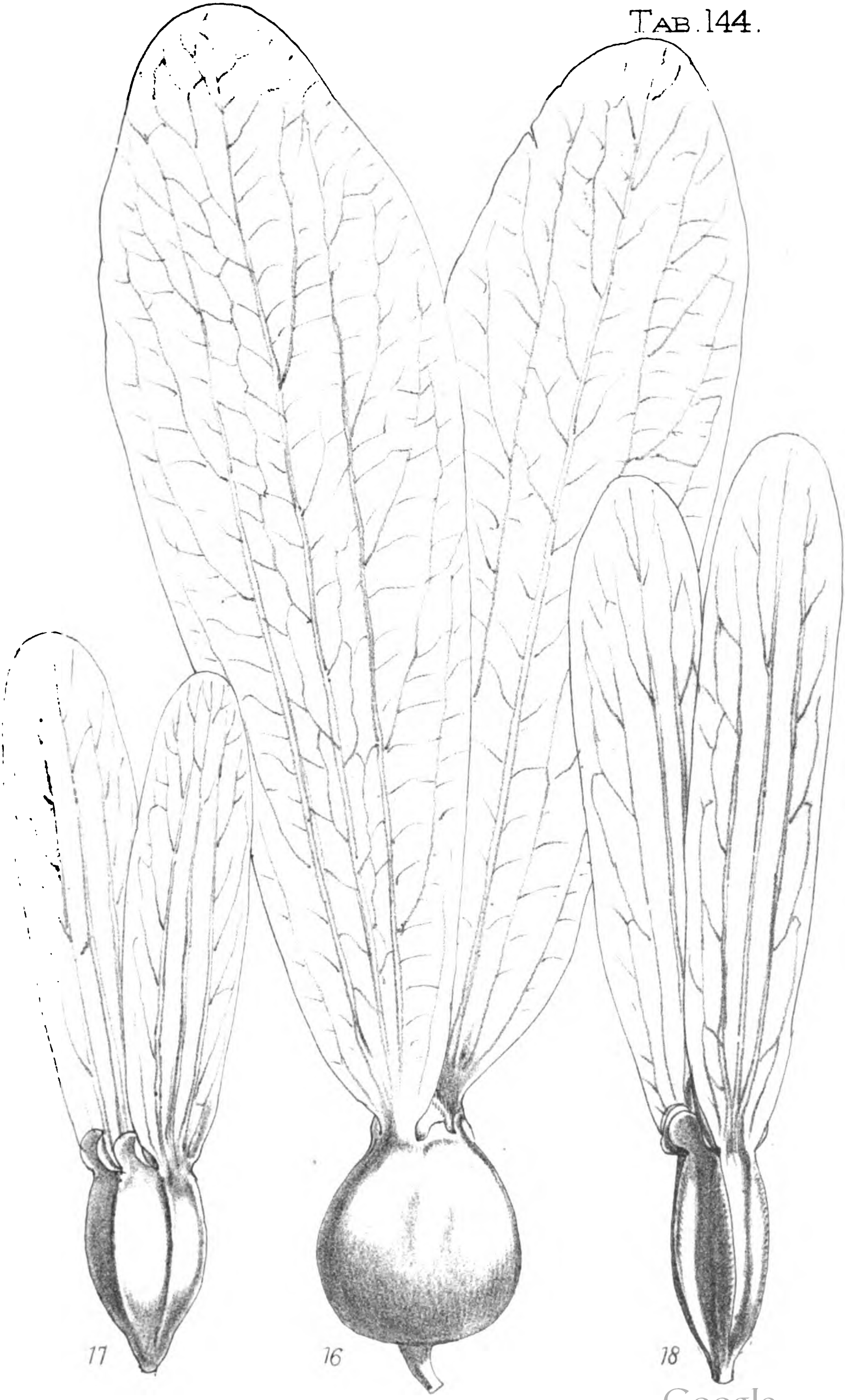

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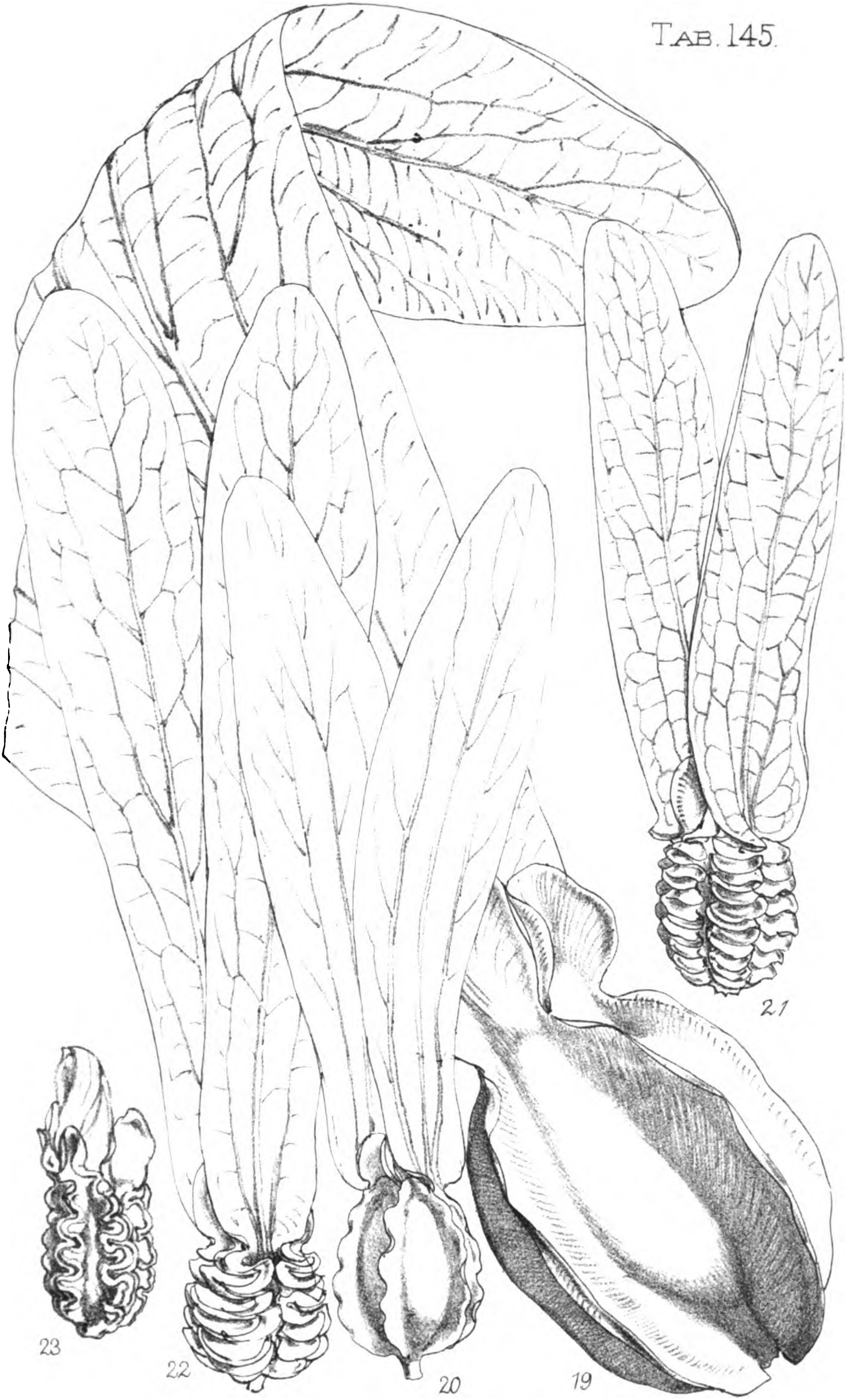

Dipterocarpus

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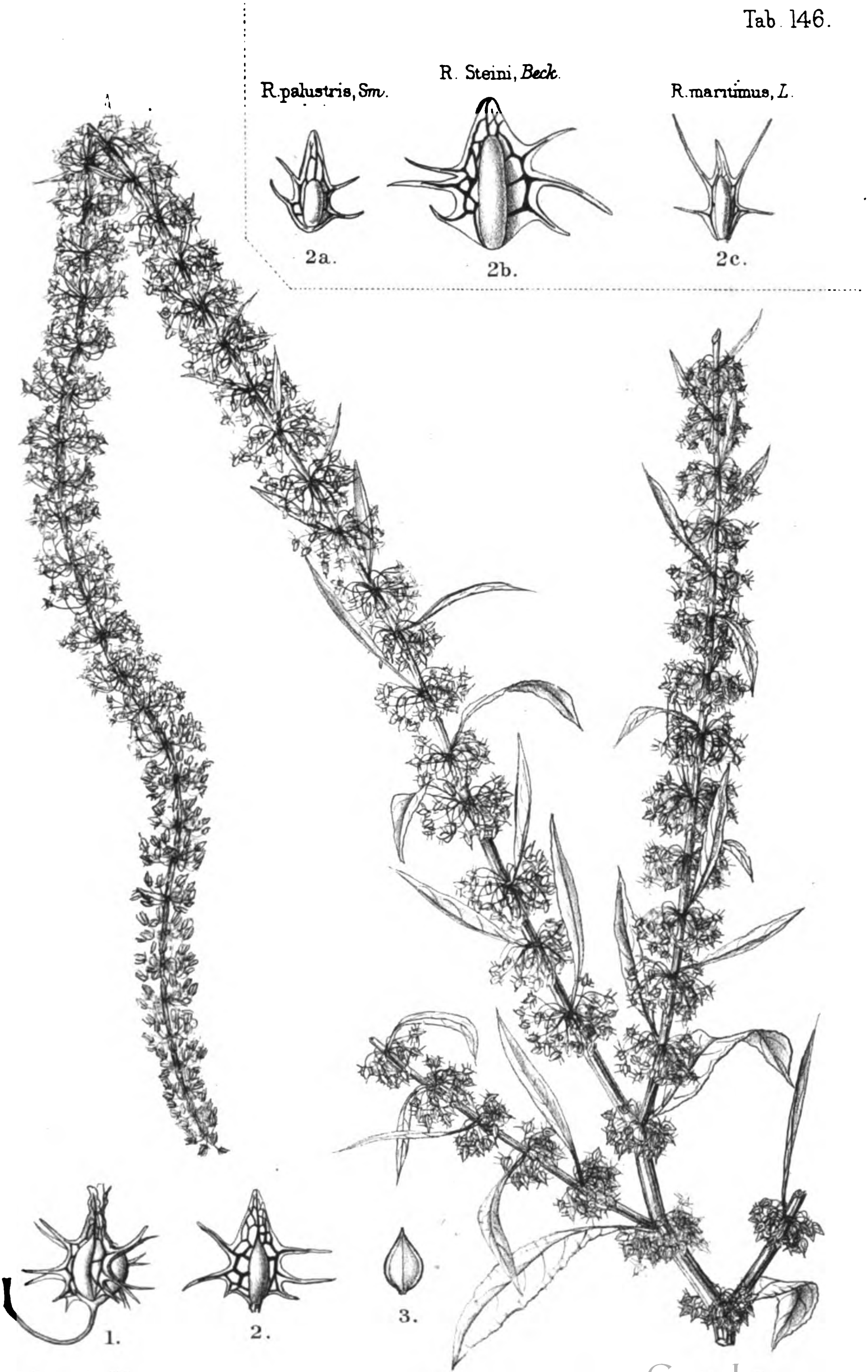

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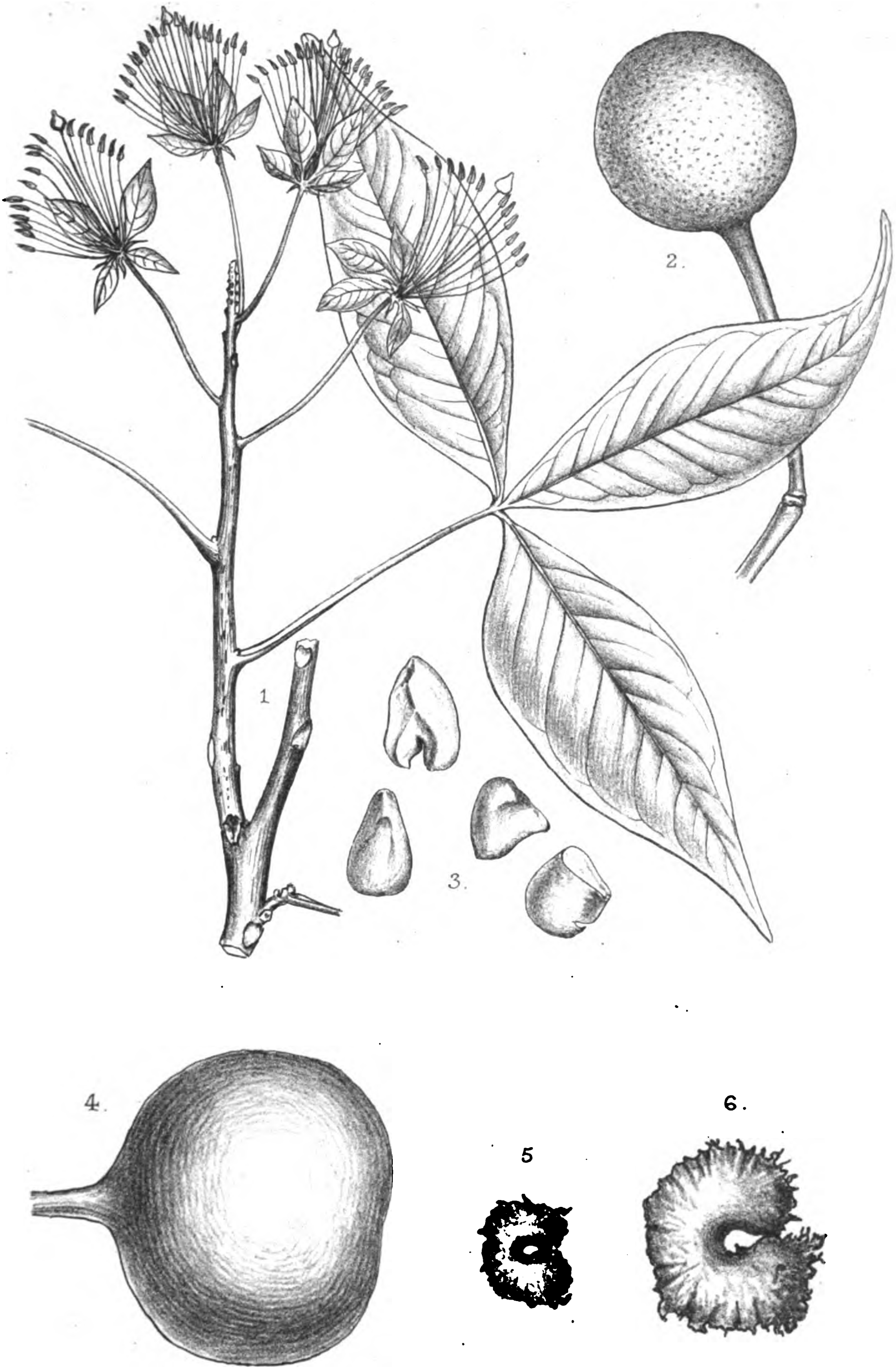
Rumex maritimus *L.* Forma (hybrida ?) Warrenii

Tab. 147.

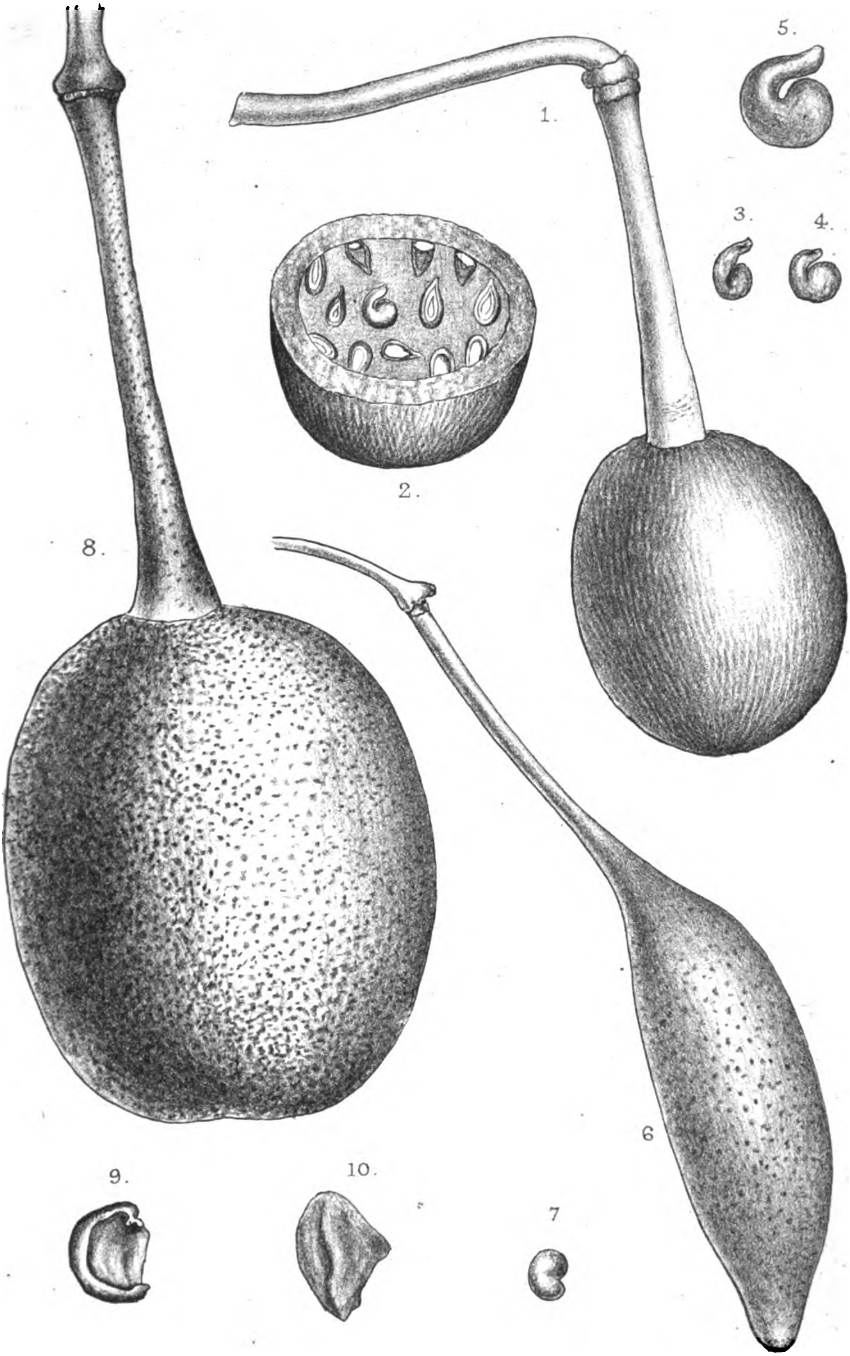


D. Blair lith

Mintern Bros. imp.

1–3. Cratæva unilocularis, *Ham.*
4–6. C. lophosperma, *Kurz.*

Tab. 148.

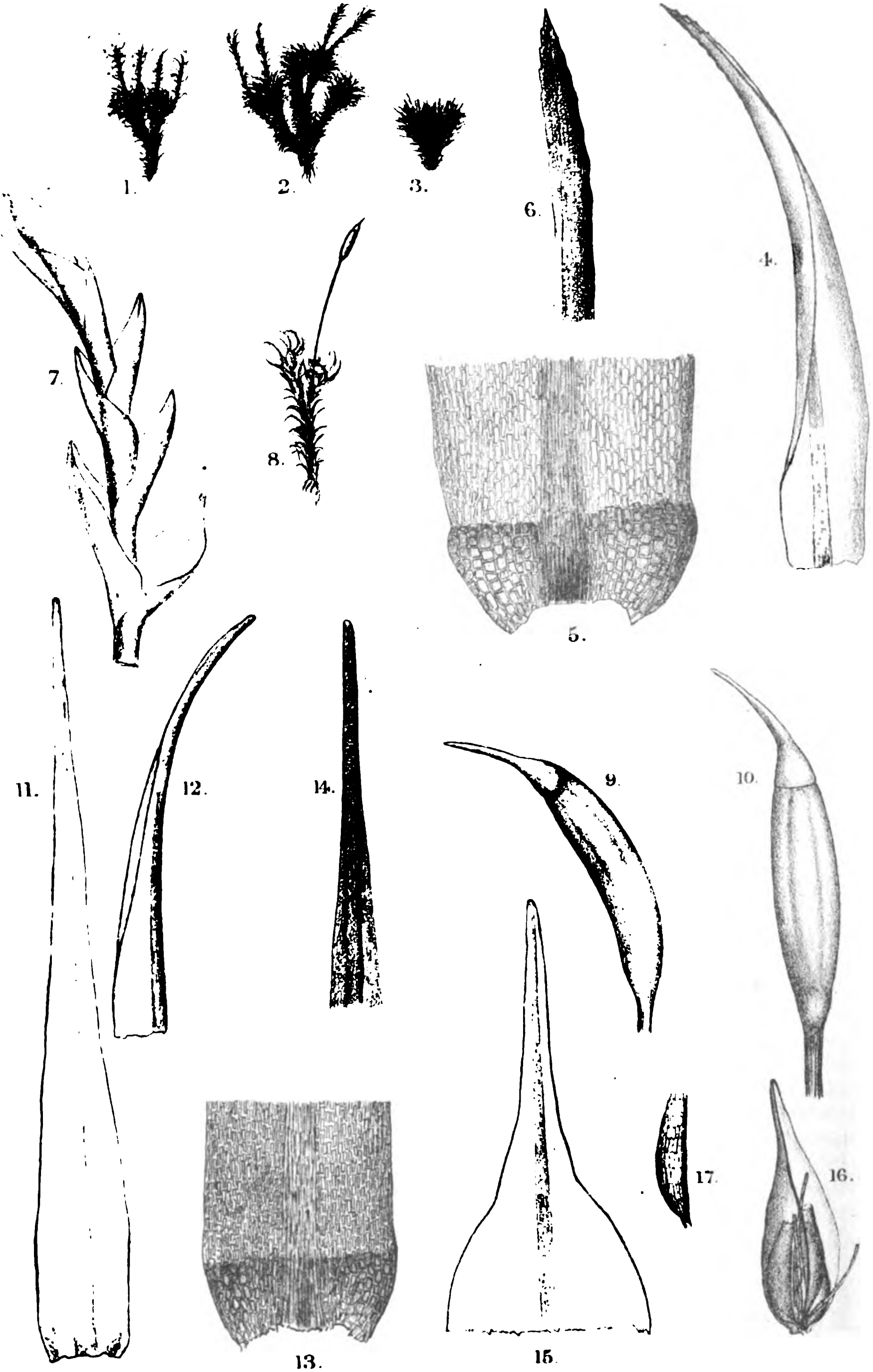


D. Blair, lith

Mintern Bros imp.

1–5. Cratæva Roxburghii, *R. Br.*
6–7. C. hygrophila, *Kurz*.
8–10. C. macrocarpa. *Kurz*.

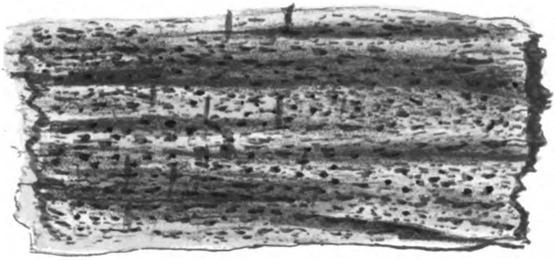
Tab 149



D Blair ad nat lith

Mintern Bros. imp

1-10. Dicranum flagellare, *Hedw.*
11-17. D. Scottianum, *Turn.*



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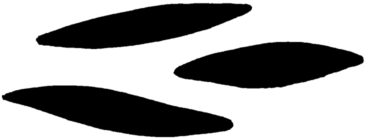

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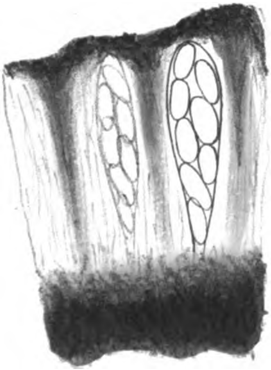

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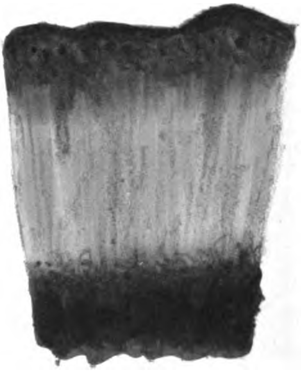

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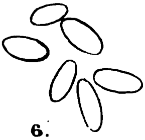

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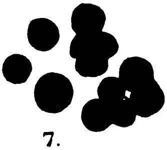

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J. M. Crombie del. Blair lith.

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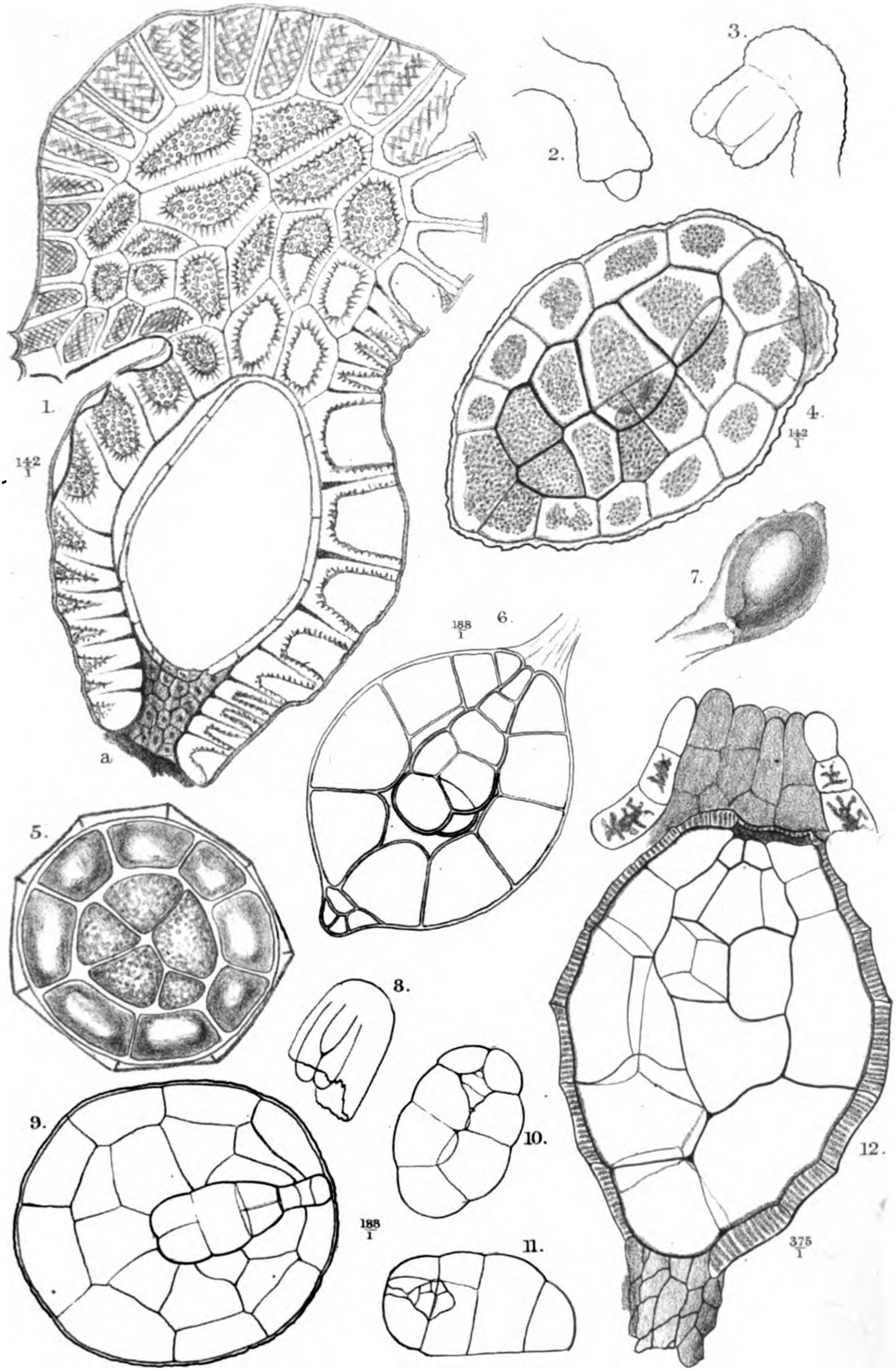
Ptychographa xylographoides, *Nyl.*



H Graf Solms Laubach del Blair lith. Mintern Bros imp

Seeds of Rafflesiaceæ and Hydnoraceæ.

Tab 152.

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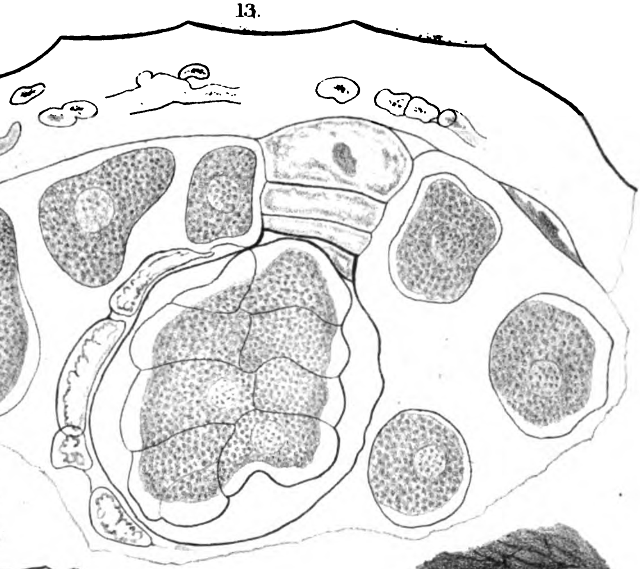

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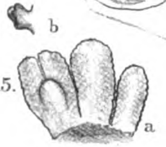

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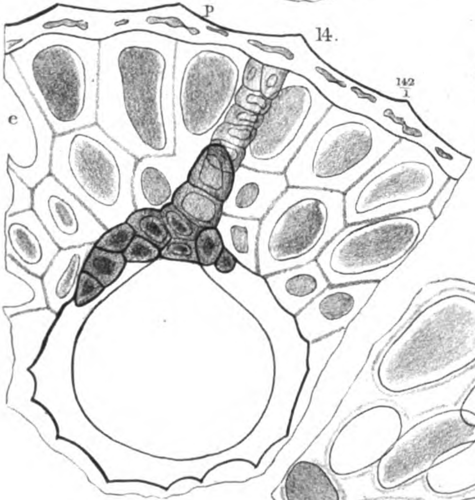

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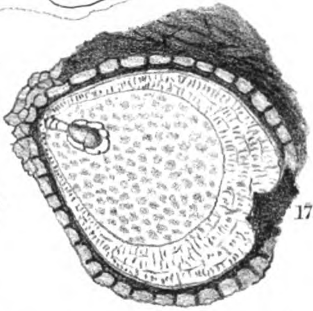

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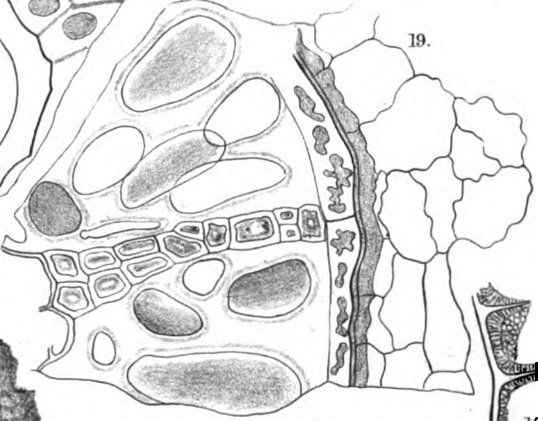

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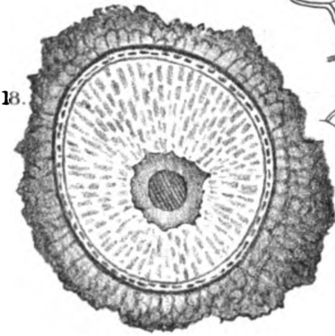

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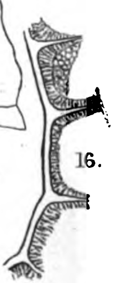

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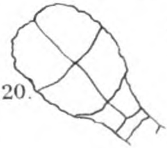

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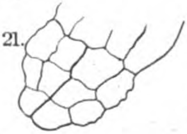

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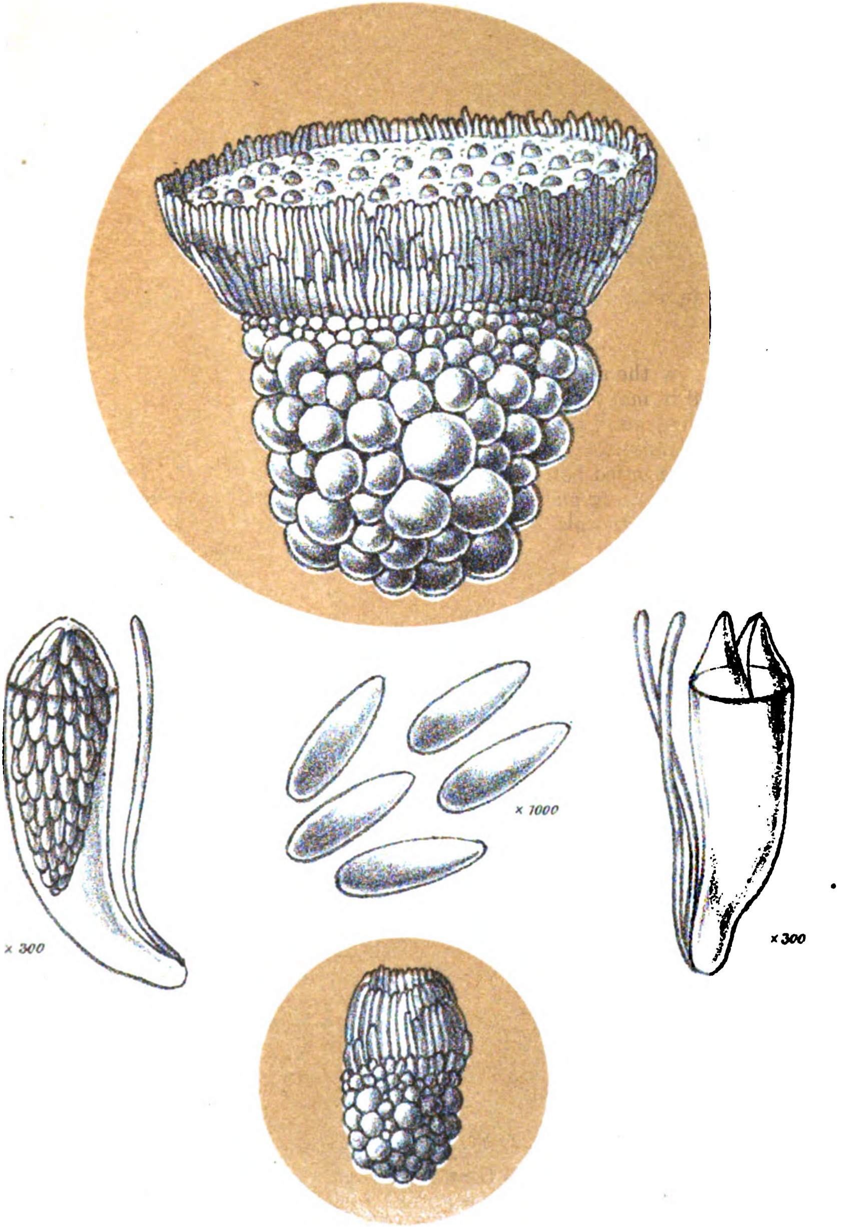
Seeds of Rafflesiaceæ and Hydnoraceæ.

Tab. 153



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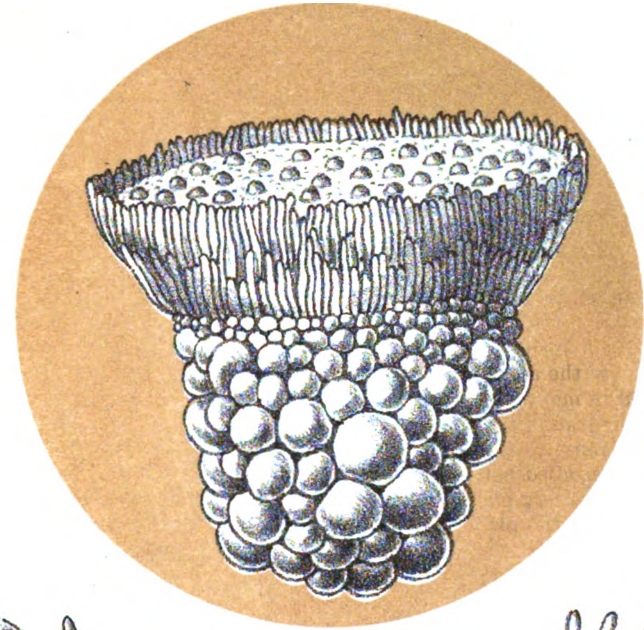
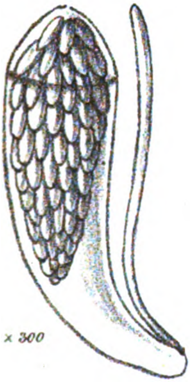
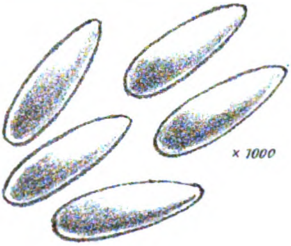
Ascobolus (Ascozonus) Woohopensis B & Br.

Tab. 153.







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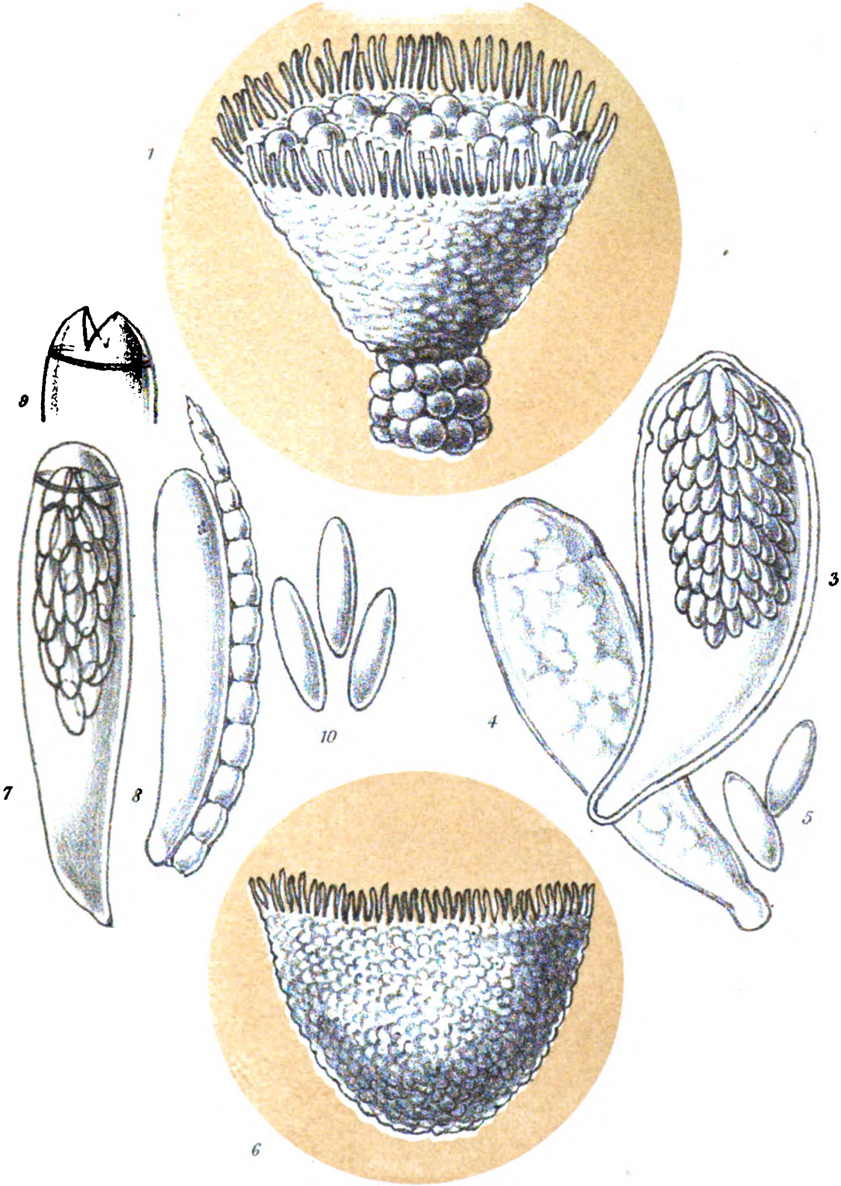
Ascobolus (Ascozonus) Woohopensis B & Br.



J Renny, del. W G Smith, lith

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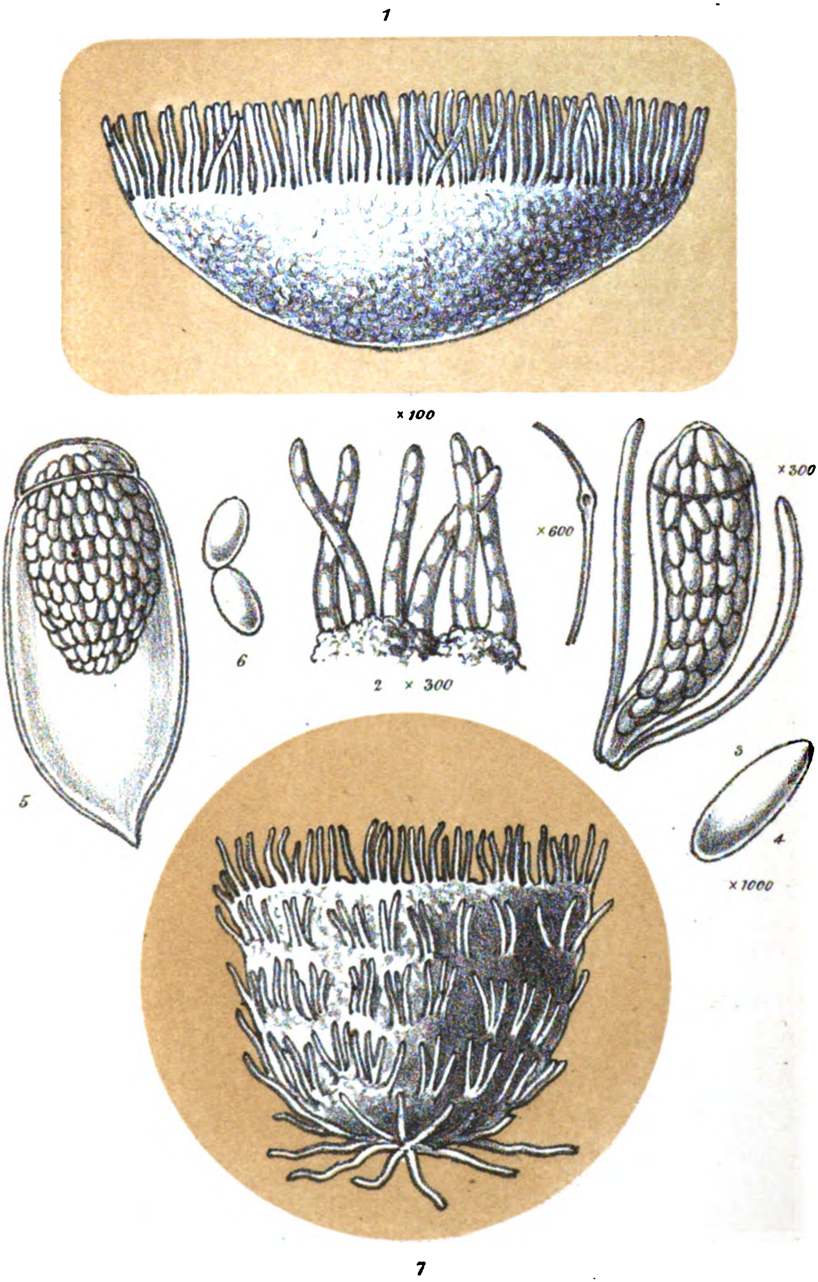
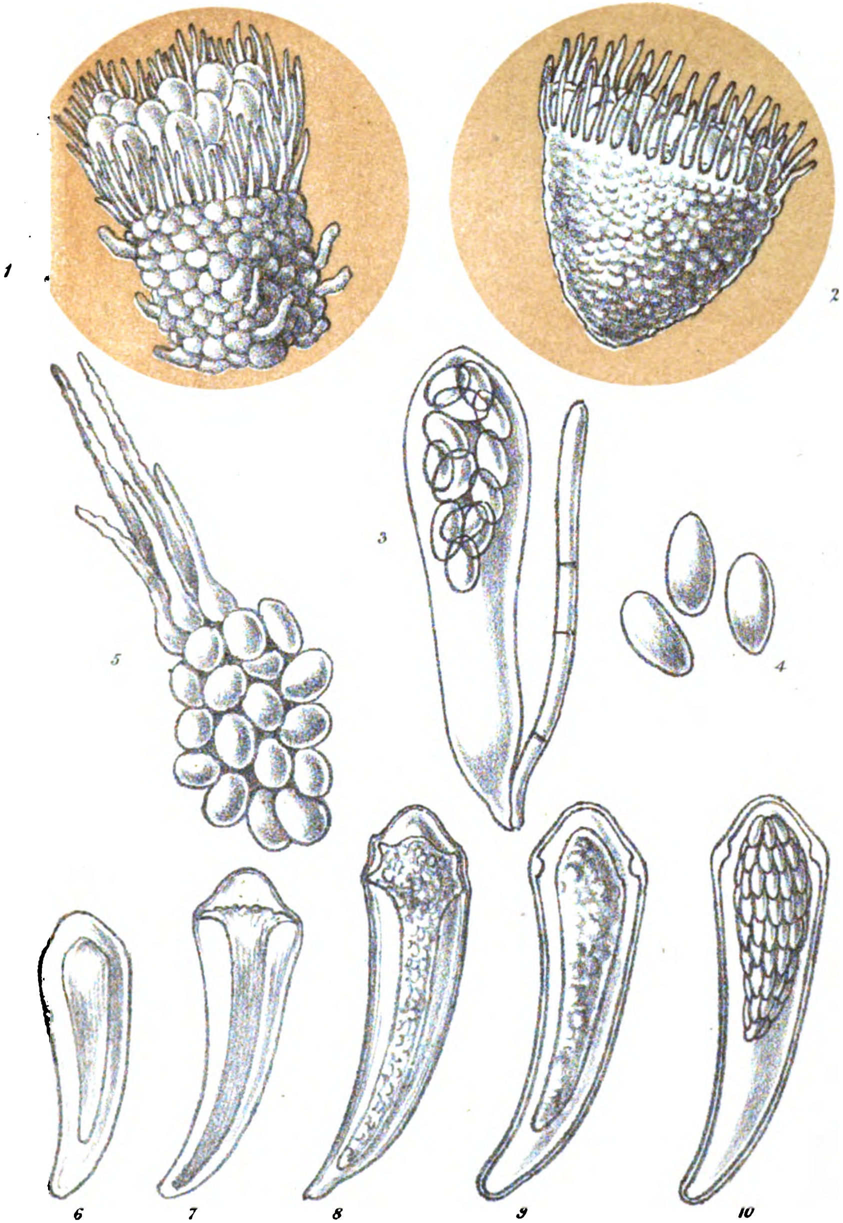
1_5. Ascobolus (Ascozonus) Leveillei Renny.
6_10. Ascobolus (Ascozonus) Crouani Renny.

Tab. 155



J. Renny del. W. G. Smith lith. Vincent Brooks Day & Son Imp.

1 2 3 4. Ascobolus (Ascozonus) cunicularius. Renny.
4 5 6 7. Ascobolus (Ascozonus) subhirta. Renny.



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1_5. Ascobolus (Ascozonus) parvispora. Renny.
6_10. Developement of the Ascus & Sporidia in Ascobolus.

Acme